ILLUSTRATED
ELECTRICAL REVIEW
A Journal of Scientific and Electrical Progress.

VOL. 26. No. 2. WEEKLY.

NEW YORK, WEDNESDAY, JANUARY 9, 1895.

$3 per Annum. Single Copies, 10 Cents.

Copyright, 1895, by ELECTRICAL REVIEW PUBLISHING COMPANY, 13 Park Row, New York.

Entered at Post Office, New York, as Mail Matter of the Second Class.

VIEWS, NEWS AND INTERVIEWS.

In the course of an article by Miss Beatrice Harraden in the current number of *McClure's Magazine*, in which she tells how she came to write "Ships That Pass In The Night," the following passage occurs in speaking of the correspondence the author has received about the book: "The funniest note of all came a few days ago. It was from a lady, saying that I had done a great deal for her by my book, and now she wanted to benefit me. She gave me the name of an electric battery, peculiarly helpful in cases of writer's cramp, and she asked me to order it through her, as it was the means of bringing her in a small percentage."

For the carbon brushes which appear to be essential to the successful working of street motor cars, Professor Forbes has recently proposed to use carbonized cloth, which is flexible and elastic, and is, therefore, not liable to be jerked off the commutator by the jolting of the car.

Samuel C. Seeley, the bank clerk who got away with $354,000 of the Shoe and Leather Bank's money, has been taken to the Kings County, N.Y., penitentiary to serve his eight-year sentence. Some time before going into the prison Seeley expressed his desire to learn electrical engineering, and he will be put to work in the electrical shops. There, it is said, he can acquire a technical knowledge of electricity, although there will be small opportunity for practical work.

Professional expert telegraphers throughout the United States have been watching with a great deal of interest the latest advancement in the science of telegraphy in the establishment of direct and simultaneous connection between New York, Chicago and San Francisco by the Postal Telegraph-Cable Company. That the great undertaking has become a fact was evidenced by the commotion created upon the San Francisco produce exchange during the past week when it was found that its members could consummate a deal on the Chicago Board of Trade and receive an answer in a very few minutes. Several deals were sent, executed and confirmed in three minutes' time. This is a remarkable achievement when it is remembered that only a short time ago from one hour to a whole day was required to receive a response to telegrams of the most urgent nature to and from Pacific coast points. All this has been accomplished only by the construction, at almost infinite pains and expense, of continuous copper wires from Chicago to San Francisco to connect with those already in operation by the Postal between Chicago and New York. The route taken by this new system was carefully chosen with respect to climatic conditions, and it is believed nothing short of an unprecedented storm can interrupt these wires for any length of time.

The *North American Review* for January contains a valuable paper on "Our Trade with China," by the Chief of the Bureau of Statistics at Washington, Worthington C. Ford.

Ganz & Company's Alternating Current Motor.

In an article describing the central electric lighting station at Cologne, Germany, London *Engineering* mentions a recent form of Ganz & Company's alternating current motor as follows:

In all towns the demands for current for electric lighting purposes are so immensely greater than those for motive power that the question of alternate current motors has nowhere yet become very important. At Frankfort, however, the municipality made a special point of the necessity of providing motive power, and accordingly the Helios Company and Messrs. Ganz & Company offered machines to be tested by independent persons. The alternate current motor of Messrs. Ganz & Company was fed from two leads, and maintained a constant speed with a varying load. It did not fall out of step until overloaded by 60 per cent. This was in 1889, and since that time great improvements have been made. A recent form of motor is shown in Fig. 1 on this page. If the magnetic arrangement shown in Fig. 2 is provided with an additional winding that acts only upon the iron of the armature, the arrangement will take the appearance of Fig. 3. The additional winding is introduced into action only during the period of starting, and is fed either directly from the main conductors, or by the induced current from some windings arranged upon the magnetic field. The armature of such a motor starts with a moderate torque and maintains approximately the same speed with all loads, even without an active winding upon the armature. The efficiency is, however, increased considerably as soon as the armature is provided with an insulated winding closed upon itself. Fig. 1 shows the complete motor. The efficiency of the five horse-power size is stated to be 74 per cent.

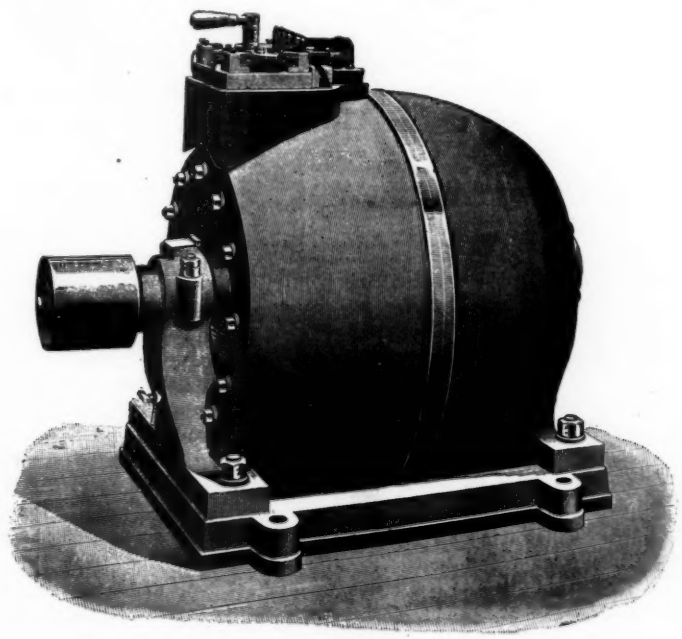


FIG. 1.—GANZ & COMPANY'S ALTERNATING CURRENT MOTOR.

The National Rapid Transit Railway Company.

Senator Teller, by request, has introduced a bill in the Senate to incorporate the National Rapid Transit Railway Company, which proposes to construct an elevated electric road between Washington and New York. The measure has been read twice and is now in the hands of the Interstate Commerce Committee, where it will probably receive action some time this week. The proposed incorporators of the road are Noah L. Jeffries, Joseph J. Reynolds, John J. Hemphill, Charles M. Shelley, Samuel M. Bryan, A. M. Bliss, Howard S. Reeside, Lewis A. Grant, Benjamin Butterworth, John F. Vinal, George F. Brott, Hamilton Diston, C. F. Kindred, Isaac D. Hetzell, Virgil D. Stockbridge, Hiram Woods, H. C. Turnbull, William L. Brown, Thomas Ewing, John C. Calhoun, Henry Cummings, Moses Sweetser and Henry T. Wells.

The proposed road will run from Washington, D. C., to a point on the Hudson River opposite New York city. A speed of 120 miles per hour is suggested and the Brott elevated system will be used. The capital of the company will be $15,000,000 and may be increased to $25,000,000.

WHAT CONSTITUTES INSURANCE?

A DEFINITION OF THE LAW AS APPLIED BY COMMISSIONER GEO. S. MERRILL, OF BOSTON—ITS BEARING ON ELECTRICAL INDUSTRIES.

A case of vital interest to the electrical fraternity in this section, involving, as it does, the right to carry on a legitimate business under the laws of the commonwealth, was called to my attention a few days ago, through the action of Insurance Commissioner Merrill, in notifying a Boston firm to stop business, and threatening an indictment before the grand jury, if his demands were not instantly complied with.

As the case in hand is one having a wide bearing on electrical interests in general, and could be used as a precedent to materially affect the standing of other concerns in the business, as well as the future of the parties involved, it would seem of sufficient importance to sift the facts thoroughly and ascertain whether or not Commissioner Merrill is in any way justified in the course he has taken.

The concern against whom his mandate was issued, and whose business he claims comes under his jurisdiction, is the Dynamo-Electric Maintenance Company, having their general offices in the John Hancock building, in this city.

The object for which the company was organized, as set forth in their prospectus, is to furnish users of electrical apparatus the means of having their plant thoroughly and carefully looked after, their machinery inspected and kept in good working order, and such repairs as may from time to time be necessary quickly and satisfactorily attended to.

Devoting their entire attention to this line of work, and having excellent facilities for carrying it on, they claim to be able to save users of electrical apparatus many dollars in the course of the year, besides relieving them from all anxiety as to the efficient working of their plant.

In addition to this an advisory board, composed of three well-known experts, is at the service of the clients of the firm, for furnishing information and advice on such points relating to the proper conduct of their plant as may be submitted to them.

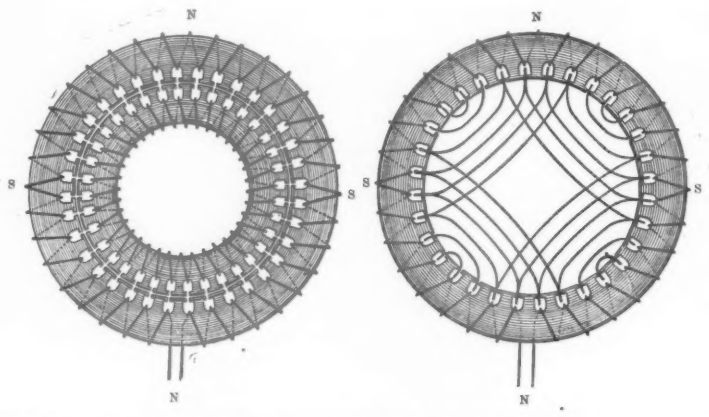
It is the purpose of the company to establish extensive repair shops in various sections, convenient to the large electrical centers, for the prompt and efficient handling of their business, and in this connection a five-year contract has been made with the well-known firm of Frank Ridlon & Company, for doing all their work in the New England States.

This, briefly, is the outline of the business which Commissioner Merrill has announced his intention of peremptorily stopping, but as there are always two sides to a question, it might possibly be as well to look into the matter a little further, before coinciding with his views.

In the first place, the commissioner is positive in declaring that the proposed business comes directly under the insurance laws of the State of Massachusetts, and bases his action on the following clause of the laws relating to insurance and insurance companies, which is known as "Section 3:" "A contract of insurance is an agreement by which one party for a consideration promises to pay money, or its equivalent, or to do some act of value to the assured upon the destruction or injury of something in which the other party has an interest."

This is certainly a sweeping assertion, and would seem to cover almost anything on earth in which one party, for a consideration, does something for another. If the term "insurance" has so wide a sweep, and is to be accepted without limitations of any kind, then it is undoubtedly the biggest interest in the world to-day and we must exercise great judgment in approaching its majestic borders.

Commissioner Geo. S. Merrill takes this view, and in an interview with your correspondent stated positively that he would accept the opinion of



FIGS. 2 AND 3.—MAGNETIC ARRANGEMENTS FOR GANZ & COMPANY'S ALTERNATING CURRENT MOTOR.—(See preceding page.)

no man on earth as against his own on this question, nor would he listen to any further exposition of the interests and purposes of the company against whom his decision was rendered.

With all due respect to Mr. Merrill and to the important position he occupies, it is still open to argument as to whether or not he can exercise so despotic a sway over any business enterprise which, in his opinion, comes within his jurisdiction.

In addition to Section 3 of the insurance laws of Massachusetts, it is fortunately specified in the statutes as to what constitutes an insurance company, and for what purposes insurance can be issued. So far as I can learn after careful investigation, the business contemplated by the Dynamo Electric Maintenance Company does not come under any of these specified heads, and in addition to this it is expressly stipulated in the form of contract between the company and its clients that they "will not be liable for accident or damage to the machinery herein specified, if such accident or damage be caused by boiler, gas, or other explosion, falling walls, timbers or other bodies, water or other liquids, fire on the premises, or any cause other than that resulting from the ordinary and usual operation of the machinery."

This is plain enough certainly and should prove that "insurance," in the common acceptance of the term, is not the object of the contract.

The whole issue at stake seems to hinge on the definition of the term "insurance" and whether it is to be accepted broadly as per the literal wording of Section 3, or subject to such conditions as a common sense view of the application would dictate.

If the former, it has a most sweeping range, and if applied as vigorously as in the present instance, would bring the commissioner into direct conflict with dozens of concerns whose business encroaches upon the insurance field, and is, in consequence, illegal.

Countless instances of this could be mentioned, but a very few will suffice to illustrate the idea in mind. For instance, the General Electric Company puts in a machine which they guarantee to keep in repair for a year. Are they an insurance company? A Boston jeweler for a stipulated sum agrees to keep your watch in repair. Is he doing an insurance business? A contractor agrees to build a bridge or dwelling house, guaranteeing to have it finished within a given time, and furnishes bonds to insure the faithful fulfillment of his contract. He practically, by so doing, insures his employer against loss, but is he in the insurance business? A towel supply company agrees to keep you in clean towels for a year for a stipulated sum. Do they come under the insurance laws? The same rule applies to the typewriter concerns who agree to keep your typewriter in condition for so much per year.

There is a clause in the contract of the New York and Boston Despatch Company, and, in fact, in common use by all express companies, to the effect that their liability shall be limited to the sum of $50, unless otherwise agreed upon. In other words, they insure the sender of an article to the amount of $50 for the safe delivery of the article entrusted to their care. A clause in the conditions on the back of a telegraph blank is still more to the point, and reads as follows: "Correctness in the transmission of messages to any point on the lines of the company can be *insured* by contract in writing, stating agreed amount of risk, and payment of premium thereon at the following rates, in addition to the usual charge for repeated messages; viz.: one per cent for any distance not exceeding 1,000 miles, and two per cent for any greater distance." This is an out and out offer of insurance, but does the commissioner exercise authority over the express and telegraph companies?

Now, does a contract to repair and keep in order certain machinery for a specified time and for a specified sum constitute a contract of insurance? We think not.

Commissioner Merrill takes the ground that it does, and the Boston daily press, as usual, without looking into the matter at all, came out with a flat-footed statement that the business of this company is illegal, and that they must stop. Such statements are calculated to do immense injury to any enterprise that is not yet sufficiently well established to command the confidence of the trade on personal grounds, and unless contradicted, leave a bad impression behind them.

Dynamo electric machinery, like everything else, is extremely liable to get out of order, and needs careful attention from its very nature and the delicacy of its adjustment. The opportunities for temporary injury to a dynamo are many, and largely incidental to the operation of the machine itself and often to the lack of skill or knowledge of those in charge. It is to obviate, if possible, these difficulties, and by careful attention to lessen the chances of damage, or when the damage is done to repair it quickly and properly, that this company was organized, and they agree to do this work for a certain yearly sum. The plan has many features which will recommend it to users of electrical apparatus, and it is hardly necessary to state that they propose to carry on their business on its original lines, notwithstanding the fiat of the Insurance Commissioner.

They have taken sound legal advice, and are assured by two of the leading counsel in Boston that they are at perfect liberty to carry on their business without interference.

While they are a foreign corporation, the active members of the concern are all Massachusetts men, and it is Massachusetts capital that is invested. The officers are Hon. John F. Merrill, of Boston, president; Leon Abbett, of Hoboken, N. J., secretary; Geo. F. Dinsmore, of Boston, treasurer; and Robert S. Ashe, of Boston, general manager. The same gentlemen, with the addition of John Dair, chief engineer of the Federal buildings in New York, constitute the board of directors; and the advisory board is composed of F. E. Cabot, Superintendent Inspection Department Boston Fire Underwriters' Union; Albert Brooks Fry, Chief Engineer United States Treasury Service, Boston; and Geo. E. Wilson, also of the Boston Fire Underwriters' Union.

All the above-named are stockholders in the company, and with

ample capital to back up their work they should make it a success.

At all events they propose to go right ahead with the development of their business, and seriously object to having their plans frustrated by the commands of Mr. Merrill, unless they are backed up by some more tangible authority than his definition of the meaning of "Section 3."

At the present time the company's charter has been accepted by the Commissioner of Foreign Corporations, and the papers are on file in his office. The extensive repair shops of the Frank Ridlon Company are ready to handle their work, and they are in the field for business.

As the case is one of general interest to the electrical fraternity, and may have a future bearing on other enterprises in the electrical field, the further action of the commissioner, if he takes any, will be awaited with interest. H. G. TUCKERMAN.

Boston, January 3, 1895.

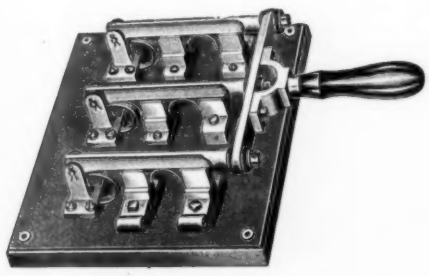
Linton & Southwick's Switches.

The accompanying illustrations show several forms of station switches manufactured by Linton & Southwick, of Worcester, Mass. This concern makes a specialty of this class of work, manufactures in large quantities and has exceptional facilities for insuring satisfaction to its customers.

The "bolted contact" switch, shown in Fig. 1, is designed for use with currents of extremely high amperage. The contact bars or blades have merely a snug fit in the jaws connecting them with the circuit. These, after making contact, are firmly pressed together by a crank-shaped disk or nut and a screw-thread on a bolt passing transversely through the jaws and operated by a supplementary handle. To open the switch the supplementary handle is raised so as to release the tension on the jaws and the switch is then easily opened.

A double-pole double-throw switch is illustrated in Fig. 2, and Fig. 3 shows a three-pole switch. Both these switches are made either double or single-throw, and all styles are provided with Linton & Southwick's patented spring. In Fig. 4 is shown a double-pole quick-break switch especially designed for high tension work. It is highly finished, instantaneous in breaking, has ample capacity in its rating for the various sizes, and, it is claimed, will not hold an arc under any circumstances. The movable portion of the switch is in two parts; the movement of the upper section of the blades places a spring under tension and finally snaps the lower section out of the contact jaws, producing an instantaneous break of considerable width. This switch is made single, double or triple-pole or double-throw.

FIG. 1.—LINTON & SOUTHWICK'S BOLTED CONTACT SWITCH.



FIGS. 2, 3 AND 4.—SWITCHES MADE BY LINTON & SOUTHWICK.

Traffic Arrangements for the Electric Light Convention.

TO THE EDITOR OF ELECTRICAL REVIEW:

The Central Traffic Association have granted our application for excursion rates to the Cleveland meeting, and it gives me pleasure to announce that the rate from all points in their territory to Cleveland will be a fare and one-third for the round trip, on the certificate plan. The other associations will undoubtedly concede the same rate, due notice of which will be given.

Yours very truly,

C. O. BAKER, JR.,
Master of Transportation, National Electric Light Association.

New York, January 4.

Mr. C. E. Sargent, who represents the Ball & Wood engine in the West, with headquarters in Chicago, was a New York visitor last week, conferring with the head office in Cortlandt street, this city.

ELECTRIC LIGHT FLASHES.

Sabetha, Kas., is talking of an electric light plant.

Pacific, Mo., is now lighted from a municipal plant.

Rockford, Ill., will have its own electric light plant.

The electric light plant at Estherville, Ia., is about finished.

There is some talk of establishing an electric light plant at Carey, O.

Pottsville, Pa., citizens will be given a chance to vote to establish a borough electric light plant at the February election.

The Shawano, Wis., Council has resolved to install electric lights and await proposals from parties competent to put in the plant.

The electric light plant at Osawatomie, Kas., was recently burned. The plant was valued at $5,000, on which there was no insurance. Its reconstruction is very doubtful.

The Common Council of Monroe, Mich., has contracted with the Monroe Electric Light and Power Company for an all-night light, 65 lamps, beginning January 1, for $3,800.

The City Council, of Little Rock, Ark., in adopting a license ordinance, added a new section taxing telegraph, telephone, and electric light and power poles 50 cents each per annum.

The bid of the Boardman River Electric Light and Power Company, which was recently accepted by the Council, gives Traverse City, Mich., all-night service for from 17 to 50 lamps at a yearly cost of $60 per arc lamp of 2,000 candle-power.

The stockholders of the Citizens' Electric Light Company, of Brooklyn, N. Y., have elected these directors for the year 1895: Hugh McLaughlin, John Delmar, James Shelvin, Thomas F. Nevins, Barnard Gallagher, Anthony Barrett and E. F. Peck.

William M. Ampt has asked the Cincinnati corporation counsel to enjoin both the Edison Electric Company and the city of Cincinnati; the former from lighting the city and the latter from paying for that service. He asserts that the contract between the city and the company is illegal and void.

The Raritan Electric Light and Power Company have again received the contract for lighting the streets of Perth Amboy, N. J., for five years from January 1, at 24 cents a lamp nightly, amounting to $6,570. No bid was received from the Perth Amboy Gas Light Company.

The special election held recently to bond South Haven, Mich., in the sum of $9,500 for the purchase of an electric lighting plant resulted in 138 votes yes and 137 no. As a two-thirds vote was necessary the project is lost for the present. The matter will come up again in the municipal elections in March.

The Edison Light and Power Company, of San Francisco, is now considering the outlay of between $200,000 and $250,000 for the purpose of laying more of its overhead wires underground. In the meantime and without waiting for this work to be accomplished there will be a cut of 10 per cent in the price of current, which went into effect on January 1.

The improvements at the plant of the Barnesville, Ohio, Gas and Electric Light Company are progressing, and all of the new machinery will be in operation by the first of March, says the Barnesville *Republican*. Among the new machinery put in will be a 100 horse-power high speed Ball automatic engine, a 100 horse-power boiler, new switchboard and three new bank boards. The 50 horse-power gas engine now in use will remain in its place for use in case of accident. The new boiler will occupy a separate brick structure, which is now being erected. A supply of water will be obtained from an artesian well 265 feet deep. The lines of the company are being thoroughly overhauled and three new circuits for street lighting and two circuits for commercial lighting are being erected. All street lamps are to be made 50 candle-power.

THE PROPOSED JUNGFRAU ELECTRIC RAILROAD.

AN IMPORTANT UNDERTAKING.

After a protracted deliberation, the Swiss Bundesrath has sent a message to the House of Representatives, advising the approval of the plans submitted by the well-known Swiss engineer, Mr. Guyer Zeller, for the construction of an electric railroad upon the world-renowned Jungfrau.

In accordance with this plan, the road shall start from Scheidegg, a station of the Wengern Alps railroad, thence in a westerly direction, passing the Fallbodenhübel, and arriving at the foot of the Eiger glacier. Thence the road runs easterly, turns southerly within a tunnel, winding around the Eiger mountain at a height of about 3,200 metres (10,496 feet) above the level of the ocean. This tunnel is to be constructed by means of galleries. The road runs next in a straight line to the Mönch mountain station, thence it winds downwards about 77 metres (245 feet) to the Jungfraujoch, whence it spirals around the top of the mountain to the well-known plateau, which, as a rule, is free from snow during the Summer season. From this point it is proposed to reach the very summit of the Jungfrau by a vertical shaft.

The length of the road will be 12.3 kilometers; its maximum grade 26 per cent, and its gauge 2.5 feet.

The waters of the Tümmel River, to be taken either at Lauterbrunnen or the Grindelwald glacier, will furnish the necessary motive power. The projector also intends to light the tunnels by electricity.

Although the proposed plan calls for difficult constructive work, the engineer figures the entire expense at but 8,000,000 francs, or $1,602,000, *i. e.*, 650,000 francs ($126,000) per kilometer of road, and 350,000 francs ($67,900) for the acquisition of the necessary rolling stock.

In submitting this plan to the Bundesrath, Mr. Guyer-Zeller assumes that 10,000 people will visit yearly the Eiger station, while 7,000 are sure to ascend the Jungfrau.

At 45 francs each, this is	530,000 fr.
Operating expenses	60,000fr.
Reserve fund plus repairs, 82,000fr.	142,000 fr.
Total net profit	387,500 fr. ($75,175)

A second plan calls for eight million shares, divided into four million preferred stock, bearing five per cent interest, and four million common stock, bearing four per cent interest.

All the details of the plan have been thoroughly inspected by the government experts, and there seems to be no reason why the proposed road should not be constructed at an early day. Even the question whether or not the sudden changes in air pressure might not affect the health of the traveling public has been carefully considered, and such good authority as the famous aeronaut Spelterini states that the air pressure, even at the summit of the Jungfrau, will not affect the health of the tourists.

In forwarding Mr. Guyer-Zeller's petition to the governments of Bern and Wallis, the "Bundesrath" suggests that if the concession be granted, the company shall maintain an observatory on the top of the Jungfrau, devoted merely to scientific researches. It is assumed that the entire construction can be finished within five years, and the charge for transportation to and from the Jungfrau shall not exceed 45 francs or $11.43.

Irrigation by Electricity.

It is a well-known fact that in nearly all the arid land regions artesian wells can be obtained at a depth of from 300 to 600 feet, the water in these wells rising to within 50 feet of the surface, says the *Irrigation Age*. In some localities they flow. There are many places where abundance of surface water can be had by digging only a few feet. Especially is this the case near streams. To utilize water-power costs much less than steam. A power plant is imperative. The full capacity of a 10 horse-power electric motor will yield power equal to a 10 horse-power engine, and, if its capacity be not overworked, will last indefinitely. The same may be said of dynamos without regard to size. The cost of a 15 horse-power motor is $500. Foundations, power house, two 500 horse-power dynamos with engines directly connected, and everything ready for operating, could be constructed for about $36,000. The power house, when run by steam, should be placed at a railroad switch. To construct for water-power might cost as much, but the operating expenses would be much less.

A 600-foot well can be sunk for $1,500. It takes 27,154 gallons of water to cover an acre one inch deep. A 15 horse-power motor will pump 750 gallons per minute, and raise the water 50 feet. Seven hundred and fifty gallons will cover 40 acres one inch deep every 24 hours, or 280 acres every week. One well will furnish water during the irrigation season, from May 1 to August 31, to cover 280 acres 17 inches deep. This is an abundance for almost any crop, and a great deal more than most crops require. The water could be pumped into a ditch or reservoir. The well could be sunk where most convenient, as the power comes to it by wire. One thousand horse-power will run fifty-six 15 horse-power motors, and will allow 15 per cent loss for transmission of power from dynamos to motor. The lines for transmission, including poles, wires, etc., would cost from $8,000 to $10,000. Thus we see that 1,000 horse-power would furnish an abundance of water for 56 times 280 acres, or 15,680 acres, about 24½ sections, at a cost, not including ditches and reservoirs, of about $160,000—a very little over $10 per acre. A larger amount is often expended in clearing some Eastern lands of timber and stones.

It takes three pounds of coal per horse-power per hour, or 72,000 pounds for 24 hours, at a cost of from $1 to $2 per ton, according to freight, or $72 per day for coal. The other power house expenses, including oil, can be run for $18. One man, with the use of a horse, can look after 10 motors, making an expense of $10 per day, giving a total operating expense of $100 per day, or $12,300 for 123 days, the entire irrigating season—less than $1 per acre. In valleys where the fall of streams is not sufficiently rapid to admit of taking out ditches, ditches can be built, the stream dammed, and the water raised to the required height by pumps through means of pipes, each pump working by motor. It makes little difference whether the water be raised perpendicularly or otherwise.

Those Subway Manholes in Cleveland.

A newspaper dispatch was recently sent out from Cleveland, Ohio, which contained the following:

The electric light company has completed an elaborate system of underground conduits, but has failed to build manholes, or to make any provision for running the wires through them.

As this presented an apparently novel state of affairs, the ELECTRICAL REVIEW asked City Electrician Hoag, of Cleveland, for further information. His reply follows:

TO THE EDITOR OF ELECTRICAL REVIEW:

Please pardon my delay in replying to yours of the 12th inst., regarding manholes for the Cleveland conduit system, as I have been absent from the city and have only just returned.

Kindly allow me to say in regard to the Cleveland underground system, that we have many miles of ducts for telephone, telegraph, fire alarm, police and electric light wires provided with manholes and junction boxes of the most improved construction.

The dispatch mentioned in your letter undoubtedly referred to a small amount of iron pipe ducts which were placed underground some 18 months ago by an eastern engineer who was employed here for a short time on underground work for series arc wires. A small amount of this work was done with a distance of only about 11½ inches between ends of pipes and no manholes were provided for the placing of cables. It will, of course, be necessary to change this before cables can be placed in the ducts. The underground work in Cleveland in a general way will, in the opinion of the writer, compare favorably in quality, if not in quantity, with any in the country.

Very respectfully,
GEO. M. HOAG,
City Electrician.

December 26, 1894.

The Ottawa Winter Carnival.

Mr. T. Ahearn, managing director of the Ottawa Electric Railway, and a member of the American Institute of Electrical Engineers, in behalf of the carnival management, extends a hearty invitation to his fellow members and their friends to visit Ottawa, Ont., during the week of the grand Winter carnival, January 21 to 26. The many attractive features of the Canadian capital city are well known to travelers, and Ottawa is generally recognized as the electrical headquarters of the Dominion.

Media, Pa., is considering the advisability of lighting the streets with incandescent instead of arc lights.

German Long Distance Telephone Lines.

[*From our German Correspondent.*]

The long-talked-of telephonic connection between the German and Austrian capitals—Berlin-Vienna—is now a *fait accompli*. The building of the line, though proprosed in the Spring of 1894, was not commenced prior to September, 1894; since then the work has progressed quite rapidly.

The only constructive difficulty was found on the line Vienna-Prague which carries four conductors. In stringing the new loop, destined for the oral exchange between the capitals, a great many of the old posts and supports had to be exchanged or replaced. The Austrian Government chose silicon bronze wire four millimeters diameter for the new line, a conductor which is largely used for European long distance work. The two international lines meet in Peterswalde (Saxony); there are 430 kilometers (266 miles) of conductor on Austrian soil, and 200 kilometers (124 miles) on German territory. Three minutes are allotted for the duration of a conversation, the charge being 1 florin, 80 kreutzers. At present, users of the international line must go to the centrals of Berlin and Vienna, respectively, a rather cumbersome arrangement, which, no doubt, will soon be changed.

It may be of interest to the readers of the ELECTRICAL REVIEW to cast a cursory glance at the existing European long distance lines. The connection between Berlin-Vienna, though measuring 660 kilometers (409 miles), is by no means the longest European telephone line, for that between Berlin and Königsberg measures 800 kilometers (496 miles), and the new telephonic connection between Berlin-Memel will by far exceed that distance.

It is only a few months ago that a series of telephonic trials have been made between Berlin and Trieste, a distance of 1,169 kilometers, or 725 miles, and very favorable results are reported. Again the German administration has experimented on a line between Bodenbach and Trieste 1,100 kilometers (682 miles), and it is stated that a line will soon be built between these cities.

The other existing European international lines are much shorter, for example, that between Bruxelles and Paris being only 320 kilometers (198 miles), while the line connecting Paris and London does not exceed 500 kilometers, or 310 miles.

Were it not for the political intrigues and jealousies existing between the several European governments (not nations), continental long distance telephony would have assumed much wider limits. At present, however, there is very little hope to see the construction of lines between, say, Paris, Berlin, St. Petersburg, Constantinople, Vienna, Trieste, Rome, etc., though no one doubts that such lines would be of the greatest possible advantage for the commercial relations of the several European nations. B.

A CURIOUS MAGNETIC PHENOMENON.

BY JOHN S. STONE.

Mr. C. O. Lloyd has observed an interesting phenomenon in the study of the field produced by broken magnets. His results were communicated to *The Electrician* (London) by Professor Ayrton, and appear in that periodical under date of November 23, 1894. The description of the phenomenon is contained in the opening paragraph of *The Electrician's* article and is as follows:

"In the course of some experiments made at the Central Technical College early in 1890, to investigate the nature of the field in the air gap of a magnet for a D'Arsonval galvanometer, Mr. C. O. Lloyd noticed

FIG. 1.—DIAGRAM OF BROKEN MAGNET USED IN MR. LLOYD'S EXPERIMENTS.

that when a magnet is broken and the pieces are put tightly together, there is not only a consequent point, or at all events a leakage of lines of force at the fracture, but there is an image or ghost of a similar consequent point, symmetrically situated with respect to the general shape of the whole magnet."

Professor Ayrton has repeated the experiments and confirmed Mr. Lloyd's results.

The Electrician justly observes: "The effect is very remarkable, and if only for the reason that, at present, no explanation whatever is apparent." In fact, if the phenomenon were as stated above, it would involve a considerable modification of our existing theories with regard to magnets.

The possibility of an explanation of the phenomenon, on existing working hypotheses, seems, however, this central point, where we should naturally expect to find it. That this was the case in a uniform magnet can only be explained, as will be seen later, if there was a greater fall of magnetic potential at the fracture than between the right and left hand extremities of the whole magnet through the outside magnetic circuit. From the following extract from Mr. Lloyd's report it seems quite likely that the above conditions existed in his experience:

"* * * I procured a broken magnet, the break being at A. (Fig. 1.) I wound it from A to B with about 30 turns of stout wire, and passed 60 amperes round it, completing the magnetic circuit in the form of a square with several pieces of iron. The result was Fig. 3 with the two halves loosely put together, and Fig. 4 when put tightly together. * * *"

Mathematically considered, the problem of locating the neutral axis in Mr. Lloyd's magnet is, to say the least, extremely complex, when a consideration of the leakage from the bar itself is included; but if we neglect this leakage, which should be unimportant compared to the induction through the outside circuit, the problem is quite simple.

From Rowland's generalization of Green's hypothesis, if h and ρ are the magneto-motive force and reluctance per unit of length of a uniform magnet of length l, and ρ_1 is the reluctance of the external magnetic circuit, the magnetic potential of any point in the axis of the magnet, distant x from its center is:

$$P = P_0 + h\,x\left[1 - \frac{\rho\,l}{\rho\,l + \rho_1}\right]$$

when P_0 is the magnetic potential at the center of the magnet.

The potentials at the ends are:

$$P_1 = P_0 + \tfrac{1}{2}\,h\,l\left[1 - \frac{\rho\,l}{\rho\,l + \rho_1}\right]$$

$$\text{and } P_2 = P_0 - \tfrac{1}{2}\,h\,l\left[1 - \frac{\rho\,l}{\rho\,l + \rho_1}\right]$$

in which ρ_1 is the reluctance of the external magnetic circuit, and ρ_2 is the reluctance of the air gap between the two magnets as indicated in Fig. 2.

To find the neutral axis we have only to equate Px to zero, which gives, when reduced,

$$x = l_1\left(\frac{\rho_1}{\rho_1 + \rho_2} - \tfrac{1}{2}\right).$$

This shows that when ρ_2, the reluctance at the break, is greater than ρ_1, that of the extreme magnetic circuit,

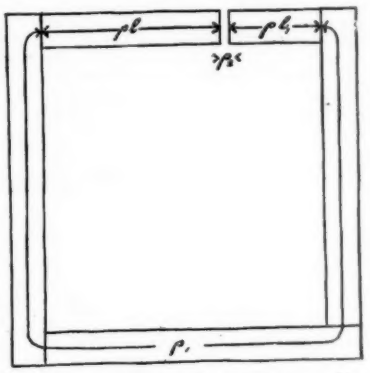


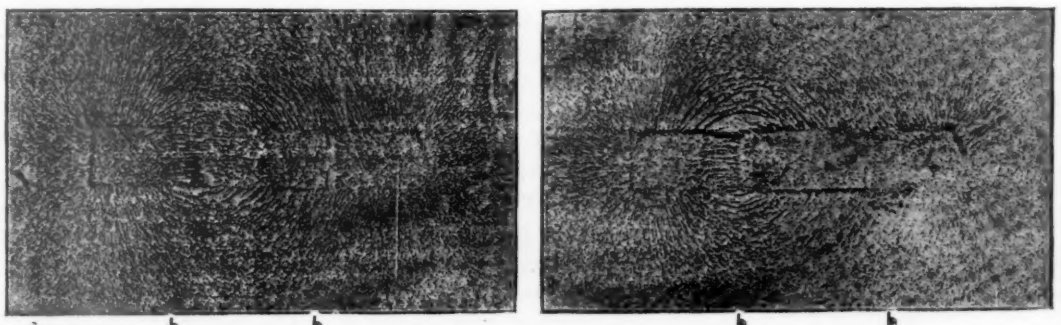
FIG. 2. — DIAGRAM ILLUSTRATING MR. STONE'S FORMULA.

the neutral axis will be deflected to the left of the center of the first magnet as it was observed to be in Mr. Lloyd's experiments. It also shows that when the reluctance at the break is equal to that of the external circuit, the neutral axis will be at the center of the first magnet, and that when the reluctance at the break is less than that of the external circuit, the neutral axis is situated to the right of the center of the first magnet.

When all the other reluctances in the magnetic circuit are negligible compared to ρ_2, we have

$$x = -\tfrac{1}{2}\,l_1.$$

This shows that the neutral axis in the first magnet can never be shifted



FIGS. 3 AND 4.—DIAGRAMS OF BROKEN MAGNETS SHOWING IMAGES AND FRACTURES.

to lie in the two diagrams, Figs. 3 and 4, given herewith, which are reproduced from the article in *The Electrician*. From an inspection of these diagrams it is evident that since the lines of force at the "*image*" are parallel to the axis of the magnet, this point cannot be called a "*consequent point*," but is nothing more nor less than the neutral axis or point of zero potential of the magnet. It is somewhat surprising, however, that in this case the neutral axis is shifted to the left of the center of the left hand or larger section of the magnet, instead of being on the right hand of and in the normal case when $P_1 = -P_2$, $P_0 = 0$. That is to say the neutral axis is at the center.

Now add at one end of the original magnet a similar magnet of length l_1, magnetized in the same direction with reference to the total circuit as the original magnet, the arrangement being as shown in Fig. 2. The potential at a point x in the original magnet now becomes

$$Px = h\left\{x\left(1 - \frac{\rho l}{\rho\,(l - l_1) + \rho_1 + \rho_2}\right) + l_1\left(\tfrac{1}{2} - \frac{\tfrac{1}{2}\rho\,(l_1 + l) + \rho_1 + x\rho}{\rho\,(l_1 + l) + \rho_1 + \rho_2}\right)\right\}$$

past the left hand pole, except the length of the second magnet be greater than that of the first. Incidentally, it also shows why no neutral axis was visible in the second magnet, it being considerably shorter than the first magnet.

Altogether, the results of Mr. Lloyd's experiments seem quite satisfactorily accounted for, if the reluctance at the fracture was greater than that for the rest of the magnetic circuit, and Prof. Ayrton can, doubtless, say whether, under the conditions of the experiment, such was possibly the case.

THE MODERN ROMANS, CAESAR'S BRASS-TAGGED DESCENDANTS.

BY C. F. JOHNSON IN THE HARTFORD "COURANT."

Under the slighting light of the yellow sun of October,
Close by the side of the car track, a gang of Dagos were working:
Pausing a moment to catch a note of their liquid Italian,
Faintly I heard an echo of Rome's imperial accents,
Broken-down forms of Latin words from the Senate and Forum,
Now smoothed over by use to the musical lingua Romana.
Then the thought came, why, these are the heirs of the Romans;
These are the sons of the men who founded the Empire of Cæsar;
These are they whose fathers carried the conquering eagles
Over all Gaul and across the sea to Ultima Thule;
The race-type persists unchanged in their eyes and profiles and figures.
Muscular, short and thick-set, with prominent noses, recalling
"Romanes rerum dominos, gentemque togatam."
See, Labinus is swinging a pick with rhythmical motion;
Yonder one pushing the shovel might be Julius Cæsar,
Lean, deep-eyed, broad-browed and bald, a man of a thousand;
Further along stands the jolly Horatius Flaccus;
Grim and grave, with rings in his ears, see Cato the censor.

On the side of the street in proud and gloom seclusion,
Bossing the job, stood a Celt: the race enslaved by the legions,
Sold in the markets of Rome to meet the expenses of Cæsar,
And, as I loitered, the Celt cried out, "Warruk, ye Dagos!"
"Full up your shovel, Paythro, ye hathen! I'll dock yees a quarther."
This he said to the one who resembled the great Imperator;
Meekly the dignified Roman kept on patiently digging.

Such are the changes and chances the centuries bring to the nations.
Surely the ups and downs of the world are past calculation.
"Possibly," thus I thought to myself, "the yoke o the Irish
May in turn be lifted from us, in the tenth generation.
Now the Celt is on top, but time may bring his revenges,
Turning the Fenian down, once more to be bossed by a Dago."

Electric Railway Development in Massachusetts.

Local capitalists of Leominster, Mass., are endeavoring to secure the franchise and privileges of the practically defunct Worcester North Street Railway Company and to construct a road from Leominster to Lancaster, connecting them with the Clinton Street Railway Company. The Fitchburg and Leominster Street Railway Company are also anxious to secure this franchise. If the latter company are successful they propose to carry out the same plan, so far as the line to Lancaster is concerned and also to open up the country by building a line from Clinton through Berlin to Hudson, then connecting with the Marlboro Street Railway Company, thus opening communication from Fitchburg to Marlboro through Leominster, Clinton, Lancaster, Berlin and Hudson, and bringing 70,000 persons into close relationship.

The Northampton Electric Railway Company are at work on a five-mile extension of their road to East Hampton, which will cost them $100,000. After leaving the highway the line will run for two miles across the meadows in a straight line. It will be finely graded and three iron bridges will be built. The five-mile run will be made in less than 30 minutes.

ELECTRICAL REVIEW

Published at 13 Park Row,

P. O. Box 2330. NEW YORK.

EDITOR:
CHARLES W. PRICE.
ASSOCIATE EDITOR:
STEPHEN L. COLES.

REGISTERED CABLE ADDRESS:
"ELECTVIEW," NEW YORK.

1546 "CORTLANDT," TELEPHONE CALL.

BOSTON OFFICE:
H. G. TUCKERMAN, Room 29, 620 Atlantic Ave
WASHINGTON OFFICE:
GEO. C. MAYNARD, 800 H St., N. W.

SUBSCRIPTION TO THE
ELECTRICAL REVIEW.

One Year, United States and Canada, - $3.00
One Year, Foreign Countries, - - 5.00
Single Copy, - - - - - - - - .10
Back Copies, each, - - - - - - .25

NEW YORK, JAN. 9, 1895.

CONTENTS.

	PAGE
Views, News and Interviews	13
Ganz & Company's Alternating Current Motor	13
The National Rapid Transit Railway Company	13
What Constitutes Insurance?	14
Linton & Southwick's Switches	15
Traffic Arrangements for the Electric Light Convention	15
Electric Light Flashes	15
The Proposed Jungfrau Electric Railroad	16
Irrigation by Electricity	16
Those Subway Manholes in Cleveland	16
The Ottawa Winter Carnival	16
German Long Distance Telephone Lines	16
A Curious Magnetic Phenomenon	17
The Modern Romans, Cæsar's Brass-Tagged Descendants	17
Electric Railway Development in Massachusetts	17
Trolley Car Accidents in Brooklyn	18
Wall Street and the Electrical Stock Market	19
The First Electrical Central Office	19
Will Electricity Cure Rheumatism?	19
Annual Meeting of the Okonite Company, Limited	19
The New Brooklyn Telephone Company and Its Wires	19
Suicide of S. T. J. Byam	19
Portable Testing Set Wanted	19
Electric Railway Development in Northern Ohio	20
Mr. Foote Wants Information on Underground Work	20
His Electrical Properties Didn't Save Him	20
National Electric Light Association	20
Electric Railway Notes	21
Messrs. Godfrey, Harrington and Olsen Receive Their Friends	21
The Callender Telephone Exchange System	21
Rhode Island's New Capitol	21
As Usual	21
Electrical Incidents Seven Years Ago	22
Views in the Works of the Berlin Iron Bridge Company	23
A Victory for the American Bell	23
Personal	23
Kindred Interests	24
The Power Station of the Steinway Railway Company	24
The Law Battery Company	24
Electrical Patents	ix
Warren & Lozier Give A New Year's Eve Dinner	ix
Electric Railway Extension in Connecticut	ix
Advance Information	x
Woodpeckers Destroy Telegraph Poles	x
Ganduxer's Automatic Line Discharger	x

INDEX OF ADVERTISERS.

COVER PAGES.

	PAGE
Abendroth & Root Mfg. Co., boilers	xvi
American Electrical Works, insulated wire	i
Ansonia Brass & Copper Co., wire	xvi
Armington & Sims, engines	xvi
Beacon Vacuum Pump and Electrical Co., incandescent lamps	i
Bunnell & Co., J. H., dry batteries	i
Campbell Electrical Supply Co., incandescent lamps	i
Day's Kerite, insulated wire	i
Eastern Electric Cable Co., insulated wire	xvi
Fort Wayne Electric Corporation, new "Wood" transformers	ii
Goubert Manufacturing Co., heaters	xvi
Hammond Cleat and Insulator Co., waterproof wall receptacles	i
Helios Electric Co., arc lamps	xiv,xv
McKenney & Waterbury, lamps and fixtures	i
New Haven Car Register Co., fare registers	xv
Okonite Co., insulated wire	i, v, xvi
Partridge Carbon Company, motor and generator brushes	i
Rhode Island Tool Co	xvi
Standard Underground Cable Co	i
Stirling Co., water tube boilers	xvi
Weston Engine Co., engines	i

INSIDE PAGES.

American Bell Telephone Co	iv
American Carbon Co., carbons	viii
American Electric Telephone Co., long-distant telephones	xi
American Watch Tool Co., bench lathes	xiv
Baker & Co., platinum	xiii
Barthel Torch Co	xi
Belden Machine Co., drop forging	xi
Belknap Motor Co., woven wire brushes	24
Bernstein Electric Co., incandescent lamps	xi
Bishop Gutta Percha Co., wires and cables	xii
Bradbury-Stone Battery Co	ix
Brill, J. G., Co., railway cars	xii
Brown & Sharpe Mfg. Co., machinery and tools	xiv
Brush Electric Co., arc lamps	iv
Buckeye Electric Co., incandescent lamps	viii
Buffalo Engineering Co	xiv
Central Electric Co., okonite wire	iii
Chapin, Chas. E., R. Thomas & Sons, porcelain	xiv
Clonbrock Steam Boiler Works, steam generators	iv
Colgate Company, Geo. L., pole paint	x
Consolidated Electric Storage Co., batteries	ix
Correspondence School of Sciences	24
Crocker-Wheeler Electric Co	23
Cutter Electrical and Mfg. Co	xiv
De Veau & Co	vi
Dixon, Jos., Crucible Co., belt dressing	iv
Dunderdale, C. F., telephone and switchboards	24
Duval, Edward S., Jr., patents	ix
Dynamo-Electric Maintenance Co	iii
Eastman Kodak Co	ix
Electrical and Mechanical Engineering and Trading Co	iv
Electric Construction and Supply Co., lamps	xi
Electric Storage Battery Co., chloride accumulators	vii
Empire China Works, porcelain specialties	iv
Falls Rivet & Machine Co., friction clutches	vi
Faraday Carbon Co., carbons	xii
Faries Manufacturing Co., electric light holder	24
Garvin Machine Co., machine tools	xi
General Electric Co., the monocyclic system	xiii
Globe Iron Roofing and Corrugating Co	iv
Hornberger Electric Co., Elkhart transformers	vi
Harrisburg Foundry & Machine Works, engines	vi
Hart & Hegeman Mfg. Co., snap switches	xiv
Interior Conduit and Insulation Co., Lundell dynamos and motors	xiv
Keasbey & Mattison Co., magnesia sectional coverings	viii
Lane & Bodley, street railway engines	vi
La Roche Electrical Works, generators and motors	xiv
Leclanché Battery Co., batteries	xiv
Leffel, Jas., & Co., water wheels	vii
Lehigh Valley Creosoting Co., creosoted lumber	x
Manning, Maxwell & Moore, tools and supplies	xiv
Marshall, Wm., condensers	xi
Mather Electric Co., power generators	x
Metropolitan Telephone and Telegraph Co.	23
Mianus Electric Co., telephones	xi
Moore, Alfred F., insulated electric wire	xiii
Mutual Life Insurance Co	24
National Conduit Mfg. Co	xiii
National Telephone Mfg. Co., desk set	ix
New England Engineering Co	ix
New York Belting and Packing Co., rubber belts	xii
New York & New England R. R	vi
New York & Ohio Co., Packard lamps	vi
Ostrander & Co., W. R., supplies	xii
Oxford Mfg. Co., sewing machines	xi
Palmer Bros., telephones	ix
Partrick & Carter Co., electrical supplies for housework	x
Penberthy Injector Co	xiv
Perkins Electric Switch Mfg. Co., switches and sockets	xiv
Pettingell-Andrews Co., Lundell motors	xiii
Phillips Insulated Wire Co., wire	viii
Phœnix Carbon Mfg. Co., carbon specialties	xiv
Riker Electric Motor Co	xiv
Robinson & Orr, steel rails	xi
Royce & Marean, electrical supplies	24
Safety Car Heating and Lighting Co., Pintsch gas	xiv
Self-Winding Clock Co., clocks	xiv
Smith, Jas., Woolen Machinery Co	xiv
Solar Carbon and Mfg. Co., carbon specialties	xiv
Splitdorf, C. F., spark coils	iv
Standard Paint Co., insulating compounds	viii
Stanley Electric Mfg. Co., S. K. C. two-phase system	vii
Stevens, H. L. C., photo-engraving	iv
Thompson & Bushnell Co	xiv
Varley Duplex Magnet Co., magnets	24
Washington Carbon Co., Helios cored carbons	iii
Western Electric Co., supplies	iv
Western Telephone Construction Co., telephones	iv
Westinghouse Electric & Manufacturing Co., multiphase motors and generators	xii
Weston Electrical Instrument Co., measuring instruments	viii
White-Crosby Co., contracting engineers	x
Wilkinson, W. H., automatic wiping device	24
Williamsport Wooden Pipe Co., creosoted conduits	xiv
Wyckoff Pipe Co., inc., creosoted tubing	xii

An article on electric railway development in Northern Ohio, which appears on another page, will be found useful and interesting. The progressiveness of the old Buckeye State is well shown in its rapid adoption of the most modern means of transit.

There's music ahead in telephone circles. The Western Electric Company has commenced suit against several of the new telephone companies, claiming infringement of some of its thousand or so patents.

Edward H. Johnson, former president of the parent Edison company, was one of the strong men in those early electric lighting days. The ELECTRICAL REVIEW would not be surprised to see him again actively enter the branches of this great industry devoted to electric light and power.

There is almost no kind of vehicle now that has not been splintered by trolley or cable cars. The motormen can boast of having struck everything, from a baby carriage to a hospital ambulance.—*Commercial Advertiser, N. Y.*

Never heard of a beer wagon loaded with kegs being struck. Murat Halstead says he wants to be present when that collision occurs. So do we—but not too near.

We have had a large number of requests for the pamphlet recently issued by the ELECTRICAL REVIEW giving instructions for resuscitating persons accidentally shocked by electricity. These pamphlets are supplied free of charge and no electric light or power plant should delay in securing one. The instructions are of the simplest character and their observance may save a life.

Seven telephone patents issued to Thomas A. Edison, and assigned to the Western Union Telegraph Company, and afterwards, we believe, transferred to the American Bell Telephone Company, will expire during 1895. Six of these will expire April 30, and one September 24. The numbers of these patents are 203,013 to 203,016, inclusive, 203,018 and 203,019. The one expiring September 24 is 208,299. Our telephone friends may find it of interest to see just what these patents cover.

Ex-Speaker Thomas B. Reed, in a recent address, used the following words:

The electric road is going to spread out our cities and will render possible a suburban life which will have the charms of the country with the social advantages of the city. It seems likely to solve for us the problem of tenement houses and the comforts of the poor. There is something in the life of cities so dear to most men that—while in all ages men have denounced cities—they could never keep away from them.

Thus do the opinions of an intelligent and thoughtful man agree with the progressive spirit and firm faith of the electric railway advocate.

TROLLEY CAR ACCIDENTS IN BROOKLYN.

We are glad to learn that Mayor Schieren, of Brooklyn, N. Y., has appointed a commission to investigate the operation of the electric railways in that city. We venture to predict that the many trolley car casualties which have occurred in Brooklyn will be traced largely to the carelessness of the victims. Nevertheless, granting that this is so, means should be provided to minimize the possibilities of injury even through the victim's own fault. We are told that last year counted 34 victims of the Brooklyn trolley cars, and since the inauguration of the system, two and a half years ago, 92 persons have been killed by them. This is a fearful record to contemplate. There certainly should be some way to prevent the greater part of these accidents. The State Railroad Commissioners and Mayor Schieren's committee will both begin their investigations this week, and we hope that every electric railway man will give them the benefit of his experience and suggestions.

Electrical men are noted for their readiness in providing for emergencies and are generally credited with being pretty wide-awake under any circumstances. Out in Terre Haute, Ind., Mr. Russell B. Harrison, the well-known electric railway man, is building a plant for the Citizens' Electric Light and Power Company in which he is also interested. The weather turned cold and it was feared would delay the building of the plant. Mr. Harrison, however, has ordered a huge tent which will be put up at once, covering the excavation just completed, where the work of erecting the plant and laying foundations for engines and dynamos will begin at once. The purpose is to heat the enclosure with exhaust steam from the power house and commence laying brick, which otherwise could not be done until warmer weather set in.

The ELECTRICAL REVIEW's criticism of the greedy and impertinent methods of the publisher of the *Electrical World* seems to have knocked that publication into the "middle of next week." The padded issue which should have appeared last Wednesday did not show up until Monday of this week. Two issues of our dull contemporary in one week—we presume that this week's issue will be published, we never intended to kill it—is an infliction that cannot be lightly borne at the beginning of this bright New Year. And we should think subscriber and advertiser—the ones who pay—would protest.

Wall Street and the Electrical Stock Market.

The first week of the new year opened under the most unfavorable auspices. The complications in the Treasury situation, caused by lack of revenues and the heavy exports of gold ($4,550,000 went out this week), render it practically certain that another bond issue must be made. This, owing to Secretary Carlisle's currency bill, which has already had the effect of causing a sharp decline in government bonds, is promised a very chilly reception at the hands of financiers. Congress will not come to the country's aid, and President Cleveland appears to be utterly powerless. It is but natural, in view of these facts, that stocks should be weak. The movement was accelerated by heavy decreases in railroad earnings and the pessimistic views of officials who did not see any light before the development of the 1895 crop.

It is just possible that affairs will become so bad that Congress will be forced to take action both on currency matters and on the pooling bill now before the Senate. This will lift an enormous load off the industries of the country and would be immediately followed by revival of confidence.

The week was a remarkably quiet one in electrical stocks. There was no feature of interest. General Electric was the most active, ranging between 34 and 34⅝, with a drop below the former figure on one or two sharp drives. The absence of any pronounced movement in the stock, in view of the pending annual report, indicates that it has been discounted and as such it is regarded as favorable. A director of the company states that it has retired $1,000,000 of its debenture bonds. This, together with an appreciation of assets, has corrected one-third of the capital stock impairment, and I understand that nothing further in this direction will be done at present.

Edison Electric Illuminating recorded but few transactions at 101 to 102. The 5 per cent bonds sold at 108. American Telegraph and Cable sold down from 93 to 91½.

The New York and New Jersey Telephone Company has declared a quarterly dividend of 1½ per cent and an extra dividend of 1 per cent, both payable January 15.

On the Boston Exchange, Bell Telephone had an upward start on Monday, going to 194. On subsequent days it relapsed to 190. Erie Telephone ranged around 51½, General Electric preferred weakened 3 points to 67, New England Telephone was unchanged at 67, and Westinghouse securities were steady, the common at 32½ to 32¾ and the preferred at 50 to 50¼. BAIN.

New York, January 5, 1895.

Mr. Francis E. Donohoe, Chicago representative of the American Electrical Works, spent the holidays in the East and was warmly welcomed by many friends in New York and Boston.

THE FIRST ELECTRICAL CENTRAL OFFICE.

INTERESTING LETTERS FROM THE INVENTOR OF THE BLAKE TRANSMITTER AND MR. CHILDS, OF THE LAW TELEGRAPH COMPANY, WRITTEN IN 1878.

The revival of interest in telephonic matters makes the early history of this most wonderful invention of particular value at this time. The location and date of the first complete telephone exchange are pretty definitely decided to have been in New Haven in 1878, as was described in the ELECTRICAL REVIEW some months ago.

A representative of the ELECTRICAL REVIEW recently interviewed Mr. William A. Childs, who was for many years manager of the Law Telegraph Company, and received from him some very interesting data concerning the early history of the telephone in New York city.

In 1874 Mr. Childs with his brother Daniel B. Childs, Homer A. Nelson, the late Mr. Frank Shaw and others, organized the Law Telegraph Company. The purpose was to give information from the Courts to lawyers who would subscribe to the service, the information to be received at the different law offices somewhat as stock quotations are received to-day. This was soon merged into the more successful method of giving every subscriber the right to use the wire from the Court House to his office by way of the "central office," the name given by Mr. W. A. Childs at that time to the focusing of the wires at a given point. This idea proved to be a successful one, and when the telephone first appeared before the public in 1877 and 1878 Mr. Childs was one of the first to adopt it for the Law Telegraph service in place of the dial and other instruments previously used.

The magneto instrument was not entirely satisfactory, and as soon as the first Blake transmitter came out there was a great desire to secure it. The ELECTRICAL REVIEW takes much pleasure in printing the two following letters, one from the inventor of the transmitter, showing his own sketch of the *first* practical Blake transmitter made. Both letters will prove exceedingly interesting to all telephone men. The Edison transmitter was brought out the same year, and was in use by the Western Union Telegraph Company, at that time opposing the Bell interests.

"Mr. Vail," mentioned in Mr. Childs letter, was Mr. Theodore N. Vail, afterwards general manager of the American Bell Telephone Company, and "Mr. Devonshire" is Mr. R. W. Devonshire, a prominent official of the Bell Telephone Company, who has been connected with that company from the date of the organization up to the present time. The letter from Mr. Childs we give with the copy of the letter head on which it was written at the time, November, 1878:

LETTER FROM MR. FRANCIS BLAKE, JR.

BOSTON, MASS., Nov. 9, 1878.

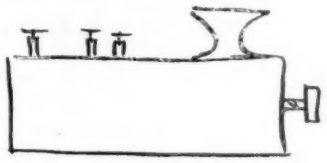
WM. A. CHILDS, Esq.,

Dear Sir: Your telegram of yesterday was received at one P. M., and I deferred answering it until four o'clock, hoping that I might then be able to advise you of the shipment of the battery telephone, which was not finished, however, until this morning.

The instrument I now send you is the best one we have made up to this time, but we have been at work on battery telephones only six days and shall doubtless improve them in the immediate future.

This instrument has worked exceedingly well, using two Daniell's cells on a city line of 900 ohms resistance—mostly around electro-magnets.

Owing to a mistake in getting up the casting patterns, it must be used in a horizontal position, thus:



THE FIRST BLAKE TRANSMITTER AS SKETCHED BY THE INVENTOR.

but the next ones will be made to screw up to the wall like box telephones.

The pressure between the contact surfaces is regulated by the adjusting screw at front of box. I send the instrument on the adjustment we have just been working, merely tieing the contact spring down with a piece of string which you will find at the bottom of the box. The cutting and pulling out of this string should, therefore, leave the instrument in working order, provided it is a good traveler; and as I am anxious to find out just how good or bad a traveler it is, I must ask you to make sure of connections and test it before turning the adjusting screw.

I have got the best results by speaking in my ordinary voice at three inches from the mouth-piece, in a low voice half an inch away, in whispering close to it. If you have a quiet place to work from you can get a delicate adjustment by turning adjusting screw to left (a turn or two), which will allow you to speak five or ten feet from the instrument. In carrying it about turn it upside down.

While it is not advisable to drum upon the diaphragm, you may safely hit it a sharp rap with a screwdriver if you wish to assure one of the permanency of its adjustment.

Please advise me by telegram as to the first working of this instrument, in order that I may, if necessary, take greater precautions in packing the instruments which are to be shipped Monday night. I shall be grateful to you for any suggestions you may be pleased to make as to its improvement.

Very truly yours,
(Signed) FRANCIS BLAKE, JR.

MR. CHILD'S REPLY.

Law Telegraph Company, Licensee of the American Bell Telephone Company. Operating in New York and Brooklyn and licensing other companies to operate elsewhere the celebrated "Law System Telephone Exchange." Manufacturers of the celebrated Law Battery for Telephone Transmitters, 140 Fulton street. Homer A. Nelson, president; Daniel B. Childs, vice-president; B. Drake Smith, secretary; Wm. A. Childs, treasurer and manager; Frank Shaw, engineer; J. C. Robinson, superintendent.

November 11, 1878.

FRANCIS BLAKE, JR., Esq.,
Boston.

DEAR SIR—The Battery Telephone with your favor of the 9th inst. arrived by express this A. M. We are very much pleased with it indeed, and have just finished working with it on a line to 66 Reade. Mr. Vail returned from Chicago this A. M., but has not yet seen it. Mr. Devonshire and the others, however, are much surprised at its wonderful work. I have telegraphed you, as you requested, as to the effect on it of the journey; it did not affect it in the least. All of our tests thus far have verified your statements fully. You speak of shipping some more to-night; are they coming to New York? We are now exceedingly anxious for one more, in order to exhibit its working on the floor of the Produce Exchange, where the Gold and Stock Company have their Edison instrument and are taking orders every day. Cannot you give us one immediately? Every day now counts against us.

Thanking you very much for your kindness in sending the telephone, and with kind regards to Mr. Watson, I am, Yours very truly,

(Signed) WM. A. CHILDS,
Manager.

Annual Meeting of the Okonite Company, Limited.

The annual ordinary general meeting was held by the Okonite Company, Limited, at the New York office of the company, No. 13 Park Row, December 27, 1894, Mr. Edward Lyman Short presiding. A large percentage of the stock was represented. Reports from the heads of the several departments showed a good business transacted by the company during 1894 and substantial indications that the business of the new year just entered upon is to be still better. The meeting ajourned after re-electing the auditors.

The New Brooklyn Telephone Company and its Wires.

Mayor Schieren has vetoed a resolution adopted by the Brooklyn, N. Y., Board of Aldermen, giving permission to the New York and Eastern Telephone and Telegraph Company to string wires on designated poles of the Fire Department telegraph service. The Mayor says no wires can be strung without a permit from the Subway Commissioners.

Suicide of S. T. J. Byam.

S. T. J. Byam, New York manager for the Pratt & Whitney company, of Hartford, Conn., manufacturers of machine tools, committed suicide by shooting himself in the offices of the company, 136 Liberty street, at 8 o'clock on Monday morning. No cause can be assigned for the deed, as Mr. Byam's monetary relations with his firm are said to be correct.

Portable Testing Set Wanted.

An ELECTRICAL REVIEW subscriber wishes to purchase some portable testing apparatus for use on electric lighting plants—voltmeter, ammeter, galvanometer, rheostat, bridge and battery. If any of our readers have such instruments to dispose of they may find a customer by sending description and lowest cash price to this office.

A reflection of the holiday spirit and the trend of reason and flow of soul in the electrical field seven years ago is portrayed on another page, where will be found a reprint of two articles which appeared in the ELECTRICAL REVIEW at that time.

ELECTRIC RAILWAY DEVELOPMENT IN NORTHERN OHIO.

THE STREET RAILWAY SYSTEMS OF CLEVELAND AND VICINITY.

In all the advance made by transportation by the medium of electricity, it is probable that no section of the United States has taken greater advantage of the suburban electric railways than northern Ohio.

Cleveland is intersected and traversed by long lines of rails, affording what is alleged by experts to be the finest system of surface street car transportation in the world. The total number of miles of railroad in the city limits is over 80 in round numbers, and in addition to that is a widespread suburban service that will ultimately extend throughout all the county. This section of the United States first conceived the adaptability of electricity for the suburban traffic. The first long suburban railroad, in connection with a regularly equipped street railroad, was operated by the East Cleveland Street Railroad Company, a corporation since consolidated with other street railroads in the city.

The suburban system of electric railroads now extends to Euclid, a distance of eight miles from the city; to Collinwood, a distance of four miles; to Rockport, a distance of seven miles, and to Berea, a distance of 12 miles, with a short line running along a country pike to Mayfield, about four miles. Other railroads are projected which will increase the mileage of the electric railroads running from Cleveland to over 100 miles.

However, not only Cuyahoga County, but other counties in the northern portion of the State are taking hold of the electric railroad project with earnestness. The longest strictly suburban railroad in Ohio extends from Sandusky, an important port on Lake Erie, to Norwalk, the county seat of Huron County, and rather a busy interior town, a distance of 16 miles. This railroad makes connection with steam railroads at Norwalk, Milan, Avery's and Sandusky. It carries the United States mails, general express, baggage, and sells tickets in connection with the Nickel Plate Railroad, which it crosses at Avery's. The fare from Norwalk to Sandusky and return is 50 cents and the cars are always crowded. Stops are made wherever passengers desire, and the farmers living along the line of the road use it in preference to trying to drive to the towns during the severe and muddy weather of Winter. The freight traffic of the road is such that two special trips per day are required with a freight car. This car was built to order for the road and conveys nothing but freight. Fruit and fish, both abounding at Sandusky in season, are shipped in large quantities. The road is constructed across country that is mostly flat. At Milan, however, there are steep declivities and grades that combine to make the operating cost of the road much heavier than it would have been had its projectors endeavored to build it to a uniform grade after the style of steam railroads. Nevertheless, the road makes a fair profit above expenses, and in time promises to be one of the best paying properties of its kind in the State.

From Elyria to Lorain there is another electric railroad. This, like the Norwalk and Sandusky line, is constructed along the side of the main highway leading between the towns, and the local traffic is a paying factor as well as the through traffic.

Among the electric railroads that are projected from Cleveland is one to Chardon, in Geauga County, another to Akron, a third to Chagrin Falls and a fourth to Medina. Of these four the one almost certain to be constructed during another Summer is that from Cleveland to Akron. This road would be about 30 miles long, through a rich and well populated country, but a country that is also rolling and filled with steep grades. It would require considerable capital to build it, and also would be quite certain to make money.

The Cleveland and Chardon railroad is something greatly wanted in Cleveland, which can reach trade in that section of Ohio only by a roundabout route. Nevertheless, it would be even more expensive than the route to Akron and it is not altogether certain that capitalists would be found willing to embark in its construction.

Probably more than 50 electric railroads are contemplated in other portions of Ohio, the most important being a line from Steubenville to New Philadelphia, a distance of 50 miles, over hills and ravines that would make the road costly and with no absolute guarantee that it would pay expenses after completion.

Hon. Martin Dodge, of Cleveland, who may be called an electric railroad enthusiast, has in mind a project for the building of a network of electric railroads throughout the State. He would connect all the counties with such roads and would build a total mileage of 4,000 miles to do it. The work would cost millions of dollars, but to Mr. Dodge's sanguine mind they would be the most economical millions ever expended in the State. Counties and cities are asked to band together and help his scheme to completion. If the idea could be carried out, as Mr. Dodge has hopes that it may some day, it might be of great value to the farming interests. As it is, however, the State would have to pay about $5,000 per mile for the construction of this railroad. That would entail an outlay of $20,000,000, to say nothing of a reserve fund for expenses, not estimated at the first computation. As Ohio has not $20,000,000 to expend at the present time there is little probability that Mr. Dodge's scheme will be put into effect.

Judging from the operation of electric lines now being handled by the larger companies, the new means of transportation appears to be a financial success to the investors. It will be only a question of time when northern Ohio will be well crossed with these electric lines, most of which run parallel to the lake, and there is a probability that within 10 years it will be possible to travel from Cleveland to Toledo entirely by electricity. The farmers who live along the suburban lines say they will never be a thorough success until every farmer shall have a switch constructed into his own premises, a car of his own, and the right at so much per annum to throw his trolley against the wire whenever he feels like it and start for town. They argue that it would be possible to connect the elevators with the main track by means of switches, and that they could load their produce on trolley cars and take it right to the cars of the steam railroads without being obliged to hitch up their horses. Indeed, it is the opinion of the farmers that many extra horses might be saved if they could use the electric railroad to transport the products of their farm as they desire to. It has not been found a difficult matter to operate the electric railroads of this vicinity during the Winter months.

Mr. Foote Wants Information on Underground Work.

To the Editor of Electrical Review:

Permit me to say to the readers of your journal that I have taken up the subject of underground conduits and conductors for all classes of electrical service.

It is my desire to produce a book on this subject that will not only give a faithful historical statement of what has been accomplished in this country in this department of electrical development, but also to give the results of experience and a clear statement of the best practice of the day, for the information and guidance of those who are yet to make investments in underground construction, and for city authorities in formulating rules and permits.

In order that I may complete this work quickly and have it, when done, of the highest degree of practical efficiency, I will thank all persons who have had experience or who feel an interest in the subject to make suggestions to me as to the plan and scope of the work, and also to indicate what information, based on experience or technical information, they are willing to place at the service of the public through the medium of my book.

By giving publicity to this request you will very greatly oblige,

Yours respectfully,

Allen R. Foote.

Washington, D. C., December, 1894.
P. O. Box 685.

A plan is on foot to consolidate the Taunton Electric Railway Company and the Globe Street Railway Company of Fall River. The idea is to consolidate these roads under the name of the Bristol County Electric Railway Company, to increase the capital and eventually to obtain possession of all the electric roads in southwestern Massachusetts. If the plan goes through important extensions will be made, connecting Fall River, Newport, Providence, Taunton and Brockton.

His Electrical Properties Didn't Save Him.

Henry Demuth is a strictly *fin de siècle* itinerant. Alcohol or the juices of poppy have combined to overthrow the intellects and queer the plays of other wanderers, but static electricity has proven Demuth's downfall and has landed him in the workhouse as a sort of half-way station to the insane asylum.

"I don't see how it's my fault," he told Judge Morris. "I didn't electrize myself, nor go to fooling with trolley wires. But I'm so full of electricity that it just boils out of me sometimes. Look here," and he bent his rather sprangly whiskers toward the metal gas lamp that adorns the court. They straightened out as if they had been unexpectedly combed. "That's the way I am," he continued. "I'm just full of fluid, and these ignorant officers think I'm drunk. I was not drunk. I was asleep in a lumber yard, not saying nothing to nobody, when that big, double-fisted ignoramus dragged me to the patrol box and sent me to the calaboose. I've been this way for nearly two years, your Honor.

"I was struck by lightning down in Posey County, Indiana, in the Winter of 1892, and ever since then it has been seeping out of me through my pores. Why, I can make a compass fairly spin around with my finger. The doctors in Indianapolis tested me and gave me a certificate, which was stolen from me by a man who is now acting as the human storage battery in a museum in Chicago. He shocks people by a wire connection, but until I weakened I could do it just with my hands. You see, the trouble with me is the current is fading. It is pretty nearly all spilled out of me; only when the weather gets muggy and foul I seem to fill up again, and then I'm apt to make a noise, you know. It ain't really me that raises ——, it's the fluid, you know."

"Yes, I know," said the Court. "It's the fluid that raises most of the Cain that comes into this court room. I shall send you to the workhouse, Demuth."—*St. Louis Globe-Democrat.*

National Electric Light Association.

Herewith is a partial list of papers to be read at the Cleveland meeting, February 19, 20 and 21, 1895:

"Some Economies in Electric Light and Power Stations," by Prof. Edward Weston.

"Arc Carbons and the National Electric Light Association Standard of Light," by L. B. Marks.

"The Monocyclic System," by Dr. Louis Bell.

"The Correct Method of Protecting Electric Circuits," by W. E. Harrington.

"The Evolution of Arc Lighting Machines," by C. N. Black.

Mr. E. A. Leslie's paper, read at the Buffalo meeting, and entitled "The Operation of High Tension Currents Underground from a Physical and Financial Standpoint," will be taken up and discussed.

ELECTRIC RAILWAY NOTES.

Officers of electric railway companies are requested to send promptly to the ELECTRICAL REVIEW *notices of meetings, election of officers, declarations of dividends, financial reports and all items of interest in connection with the financial and practical operation of their roads.*

The Binghamton, N. Y., Railroad Company makes the following comparative statement for the six months from July 1 to January 1, 1893 and 1894:

	1893.	1894.	Gain.
Receipts	$57,654.32	$70,913.16	$13,258.84
Operating expenses	31,394.20	36,403.48	
	$26,260.12	$34,509.68	
Taxes	1,400.00	1,551.00	
Net earnings (six months)	$24,860.12	$32,958.68	8,131.56
Operating percentage of receipts	54⅛%	51⅛%	
Percentage of gain in receipts, 1894 over 1893			23%
Percentage of gain in net receipts			32¾%

The newly incorporated Trenton, N. J., Traction Company, which for several months has been negotiating for the lease of the Trenton Electric Railway, has acquired control of the system by purchasing the ten-thousand-share interest of Col. Lewis Perrine, paying, it is said, $500,000 for the block. The company has elected Thomas C. Barr, of Newark, president, and John L. Kuser, of Trenton, as secretary and treasurer. Henry Moore, of Philadelphia, is to be manager of the road.

The electric railroad connecting Thirty-fourth Street Ferry in Long Island City, N. Y., with Lutheran, Mount Olivet and other cemeteries, and owned by ex-Mayor Patrick J. Gleason, has been sold, it is said, to the Steinway Railway Company, which operates trolley lines in other parts of the city. The corporation name of the road is the Long Island City and Newtown Railroad Company. Negotiations for its sale have been going on for some time. The price reported is $250,000. The road does a big business in Summer, but it is said not to be a paying property in Winter. Besides the lines to Blissville and the cemeteries, the road holds a franchise upon Jackson avenue from the city line to Flushing. Mr. Gleason declined either to admit or deny the report of the sale.

Chicago capitalists, in conjunction with others in New York and California, may undertake an improvement in the Golden State in the shape of an electric road, which will involve an expenditure of $2,500,000. The projected road is to run from Merced, in the San Joaquin Valley. As planned, it is to continue from that town into the heart of the Yosemite Valley, a distance of 100 miles. The idea is to provide modern transportation facilities into the Yosemite. At present visitors leave the railroad either at Merced or Raymond and travel by stage into the valley. It is a four days' journey for the round trip, and a laborious mountain climb for animals, although the same distance could be traversed under some conditions in a few hours. Despite the discomforts of the trip, many people visit the region. By an electric road the journey will be reduced to a five hours' ride in a comfortable car. It is proposed to equip the road for freight traffic in connection with passenger business.

Messrs. Godfrey, Harrington and Olsen Receive Their Friends.

The new offices of the India Rubber and Gutta Percha Insulating Company, at 15 Cortlandt street, New York city, were crowded with the friends of Messrs. J. W. Godfrey, F. W. Harrington and J. B. Olsen, the company's new battalion of salesmen, on Monday afternoon, December 31, from two to six o'clock. The many friends of these three gentleman took the opportunity to wish them well in their new connection and to accept their hospitality. Luncheon and several kinds of tea were served bountifully.

The Callender Telephone Exchange System.

There will shortly be submitted to the public an entirely new system of telephone exchange, the apparatus for which is illustrated herewith. Several years have been spent by the inventor in perfecting his system, which is protected by over a dozen patents. He has dispensed entirely with operators and discards the expensive switchboard with its numerous connections. Subscribers make their own connections automatically by the use of a simple device attached to each telephone.

This invention claims to mark the introduction of a practical automatic exchange system, as it dispenses with extra wires and multiple connections and does not require an individual apparatus at the exchange for each subscriber. By a simple arrangement the connecting mechanism at the exchange is common to all of the subscribers, and 90 per cent of the installation expense is saved by providing only sufficient apparatus to meet the maximum demands of the subscribers at one time, on the theory that only a percentage of the total number of telephones is ever in use simultaneously.

The new system provides means for registering the number of connections had by each subscriber, so that, where desired, payment for actual use may be arranged for on an equitable basis. It takes only 12 seconds to establish a connection, no matter how high the number called.

These improvements are designed to make the construction and maintenance of an exchange so much less expensive than existing systems that telephones can be supplied to subscribers at from 30 to 60 per cent less than present rates; the exact saving depending upon local conditions. This system is the invention of Romaine Callender, and the public exhibition will shortly take place at his laboratory in the Decker building, Union Square, New York city.

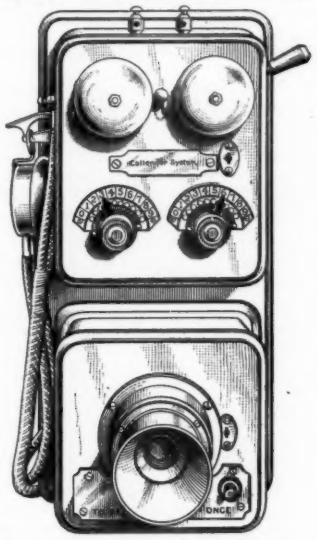


FIG. 1.—SIGNALLING TRANSMITTER.

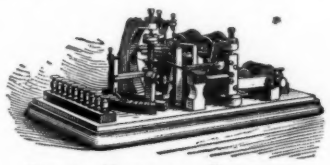


FIG. 5.—NUMERICAL RECEIVER.

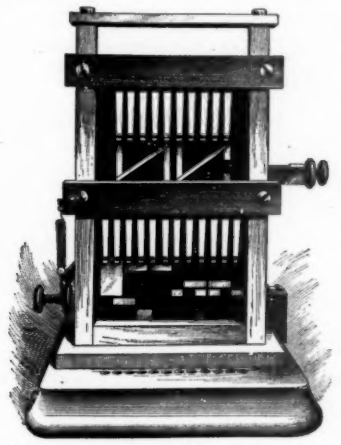


FIG. 4.—PROGRESSIVE SWITCH, END VIEW.

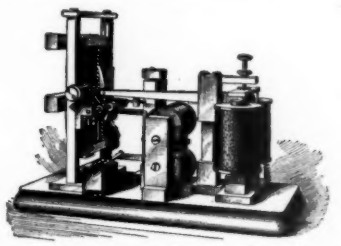


FIG. 3.—PROGRESSIVE SWITCH, SIDE VIEW.

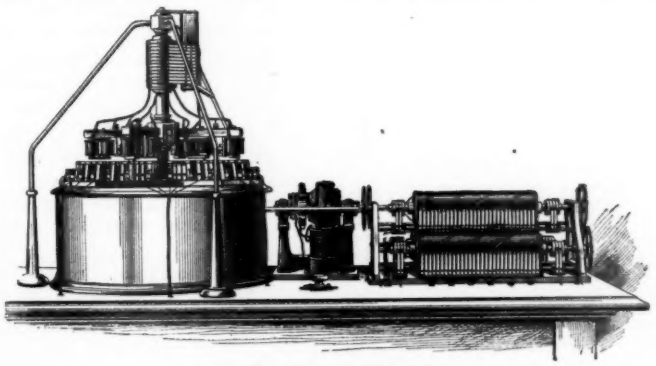


FIG. 2.—CIRCUIT SELECTOR.

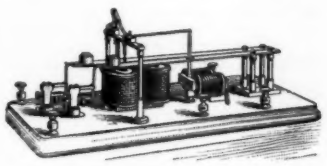


FIG. 6.—NUMERICAL SEPARATOR

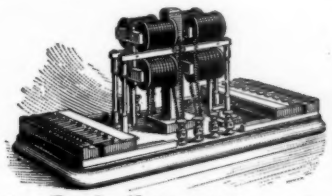


FIG. 7.—NUMERALIZER.

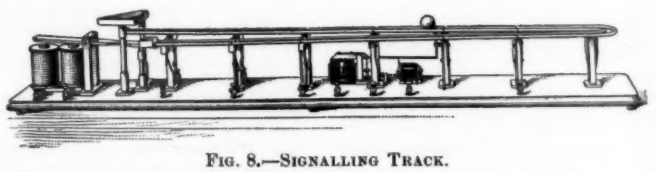


FIG. 8.—SIGNALLING TRACK.

APPARATUS USED IN THE CALLENDER AUTOMATIC TELEPHONE EXCHANGE SYSTEM.

Rhode Island's New Capitol.

The State of Rhode Island is to have a new capitol to cost $1,500,000. The architects are McKim, Mead & White, of New York city, who have about completed all the plans for its construction. Under an act of the Rhode Island Legislature the Capitol Commissioners were empowered to condemn lands for the new State House and park, and the Rhode Island Supreme Court was directed to appoint three commissioners to determine what the State shall pay for the condemned lands.

Hon. Gardiner C. Sims, general manager of the Armington & Sims Engine Company, of Providence, was appointed chairman of this commission, and has given the matter a great deal of attention since his appointment in July last until the close of the final hearing on December 29. This commission is the only one of its kind ever appointed in Rhode Island, and the amount of money involved in their considerations is enormous.

The lands to be condemned are situated on Smith's Hill, in Providence, nearly north of the new railway station, and the gilded dome of the new capitol will be visible from every county in the State.

As Usual.

The ELECTRICAL REVIEW "scooped" its contemporaries last week by being the first to announce the Berliner telephone decision.—*Progress, Washington, D. C.*

The South Middlesex Electric Street Railway Company, operating the line between South Framingham, Natick and South Natick, are contemplating an extension of their line to Ashland and Hopkinton, Mass.

ELECTRICAL INCIDENTS SEVEN YEARS AGO.

THE GIFTS RECEIVED BY ELECTRICAL INDIVIDUALS IN 1887, AND JUST WHY THEY SWORE OFF ABOUT THE SAME TIME.

We reproduce from the columns of the ELECTRICAL REVIEW of December 31, 1887, and January 7, 1888, as appropriate to this holiday season, a list of supposed Christmas gifts and names of recipients, and some "swear-offs" recorded the first week in January, 1888. These genial paragraphs will, we think, prove of interest now. They appeared at the time the Electric Club, of New York, was in the height of its success, and are given just as they were published in the ELECTRICAL REVIEW seven years ago. Some of the gentlemen have joined the great majority; and some have entered into other business. Old times in electrical circles will be revived to many who read what follows.

[*From Electrical Review, December 31, 1887.*]

SANTA CLAUS ELECTRIQUE. — CHRISTMAS BEQUESTS PRESENTED BY ELECTRICAL PEOPLE.

Geo. L. Phillips: "Say, Old Santa, just pass another telephone company this way."

E. R. Weeks: "Don't believe I'll refuse it this time. It beats the vice-presidency."

E. T. Gilliland: "The 'Goddess of Electricity' will I give the Electric Club. The phonograph will keep me busy."

M. W. Goodyear: "Fill my stockings with fresh soluble brains. Mine are tired out."

C. O. Baker, Jr.: "No more House Committee work for me, Sir Claus. I've figured myself blind over the cost of pickles and green peas. If you've a platinum mine, just throw it down the chimney."

John B. Powell: "Another trip to England, by Jove!"

Geo. L. Beetle: "Chicago is a magnificent city. (Say, just hand me down a visit to New York.)"

Thomas A. Edison: "There it is—that package labeled 'Electricity Direct from Coal!' That's what I intend to have."

Geo. W. Hebard: "My new electric light factory, rising like a Phœnix from its ashes, fully satisfies me."

H. B. Thayer: "My only fear is if I become rich suddenly I'll lead a fast life. Howsoever, I'll take that million for the gas burner."

John A. Seeley: "The same here."

C. D. Haskins: "And here."

Henry C. Davis: "As I haven't had very much to do this year, just pass me another Electric Club."

Eugene F. Phillips: "A new clam-bake design."

H. C. Adams: "Oh, I'm all right. Used to have to hunt up the boys; now they hunt me up."

Edwards H. Goff: "The *Graphic* is sufficient. I would take another Goddess of Liberty, however."

Henry D. Stanley: "Throw me down a few hard-drawn copper orders that don't have to be filled until next November."

Hugh R. Garden: "The cosiest legal department in New York, in our Twenty-third street office."

John R. Mulvane: "The presidency of the National Telephone Association, do you say? Well, now, I'll think over that."

Willard L. Candee: "Thanks. A trip to Paris was just what I wanted."

H. L. Storke: "Having been an editor, my modesty prevents my speaking up, but if there are any New York telephone companies running around loose, just mark them 'C. O. D. to Pooh-Bah.'"

Geo. H. Benjamin: "How would it do, Uncle Santa, to hand me down a vindication?"

Chas. Dutton: "A new lecture, please."

John W. Beane: "Bunker and I had something to do with starting the Electric Club. Just read the minutes. Two medals, sil vous plait."

Ed. A. Leslie: "I'll take a telegraph company with staying powers."

F. W. Jones: "Just as willing to be cross-examined by W. U. attorneys again as not—in fact, I rather like it."

F. W. Jones (of South America): "Since getting a new wife, and a new—well, Old Santa, I don't want anything."

H. M. Byllesby: "No toys for me, I've got an electric meter."

Henry Hine: "Just put a name for my new book into my left stocking, and oblige."

W. S. Hine: "Another Philadelphia brewery—for electric lighting purposes."

Leonard E. Curtis: "Some more Westinghouse correspondence."

George Westinghouse: "Bring on the Electric Light Convention."

Stephen D. Field: "I've got the motor, Eickemeyer the dynamo, but you might throw a few more wide-awake railway companies in through the window."

Clark B. Hotchkiss: "A few more cable orders to round out a big year."

S. Insull: "Kind of lonesome up here at Schenectady. Just present me with two visits to New York each week."

John I. Sabin: "Send me a vacation."

C. J. H. Woodbury: "I want three phonographs quick, or I'll be snowed under with work."

J. N. Keller: "By way of change, I would like to ride between New York and Boston."

Fred. A. Gilbert: "No! I don't want a sheet of music, I tell you. I'm not John L. Sullivan's partner."

H. M. Linnell: "The unspeakable Turk."

F. W. Toppan: "A bag of black sand for Goodyear."

Robt. Mackie: "A wig."

R. W. Blackwell: "A lightning express to Denver."

Thomas P. Conant: "Another presidential train with a storage battery conductor."

Geo. B. Coggeshall: "Less 1 A. M.-ism at the Electric Club."

A. S. Hibbard: "A telephone cabinet set in the office of the man in the moon."

Frank Ridlon: "Oh that this too solid flesh would melt!"

H. W. Spang: "Here too."

Louis Duncan: "A glimpse about 12 months ahead on the storage of electricity would make me happy."

Geo. F. Porter: "More carbon combinations to conquer."

Norman McCarty: "Conquests are still so numerous that I ask for nothing more."

J. H. Reid: "An engagement ring? Thanks, Santa."

A. V. Garratt: "To ask for aught would not become me, so great a gift have I recently received."

W. W. Smith: "The 'Reform' medal."

F. B. Knight: "A French grammar. Wee, wee. I can parley fransay. What did Sheridan say about Texas?"

M. M. M. Slattery: "A new definition of electricity."

Gardiner C. Sims: "Just hold on a little while. I can wait."

A. F. Upton: "Cheap fuel."

H. L. Shippy: "An extra hour—so I can visit the Electric Club."

Frank C. Mason: "Everybody with the rheumatism."

Chas. A. Cheever: "An induction telegraph is just what *you* need, Col. Claus, for use in your aerial trips."

J. C. Tomlinson: "Avaunt, avaunt, old man! Time for converse have I none. Stay! Prithee, the gift of song will come not amiss. I would out-sing the gallant sea-dog Toppy."

Fred. Royce: "Another game of hearts with Stanley and Goodyear."

Thos. B. Doolittle: "This is different. The 'ground floor' just once would be great medicine."

Otto A. Moses: "Paris is good enough for me."

H. D. Lyman: "No, I am not a lineman. Your gift of spurs and pliers are herewith returned."

Frank Beach: "What I particularly like is a handsome traveling bag—with a patent lock."

George F. Durant: "Some more Law switchboards, and please don't call them 'Lawless.'"

Frank Harrington: "A lower berth."

C. H. Wilson: "As compared with Columbus, I'll be pleased with Chicago."

J. F. Morrison: "Anything except the presidency of the Electric Light Association."

Wells W. Leggett: "Some additional tower lighting."

S. A. Duncan: "What I want to know is who will be in Pittsburgh next February?"

Thomson-Houston Bailey: "A few more corner lots in Kansas City."

A. C. Smith: "A competitive watch test."

C. A. Brown: "Some one to help me fill these electric light orders."

John A. Barrett: "Please don't send me any more primary batteries. Life is too short to examine them all."

Stephen Holbrooke: "A glass of diluted water."

C. D. Crandall: "A home in a town where the mud is not all above the pavement."

E. L. Smith: "Twenty per cent."

Col. D. B. Parker: "Send me some more Rochesters."

Theo. N. Vail: "As I have the earth (for my super-heated steam pipes) what more could I ask for?"

Chas. K. Wead: "An invulnerable wire gauge."

H. N. Fenner: "More braiding."

T. J. McTighe: "You would confer a favor, my grey-bearded friend, if you would tell everybody how to pronounce my name. It's all I ask."

S. S. Wheeler: "Just hand me a few electrical problems; I enjoy them."

R. T. McDonald: "More worlds to conquer."

C. A. Coffin: "Give me Aladdin's lamp, so I can instantly build another electric light factory."

W. F. Swift: "The good old journalistic days were halcyon days indeed, but I guess I'll stay in the electric lighting business a few years more. Just send me a few more Southern contracts."

F. A. Cheney: "I would like some antifat."

E. I. Garfield: "Two and one-quarter minutes more time for lunch."

H. G. Cheney: "Ask Pulsifer."

N. T. Pulsifer: "The paper manufacturing business possesses some interesting features, but for real surprises I know of nothing that equals electric lighting. With a new factory, orders rushing and a loyal staff, guess you can pass us by, Santa."

H. A. Glasier: "A night-key."

Fred. Swift: "On the whole, I'd rather catch whales. So give me a ride to San Francisco."

R. K. Dana: "As we are not extending our obligations, guess we can't accept your gift, Uncle Kris."

W. E. Sharps: "Another rag for the commutator."

W. B. Buchanan: "A good hand."

T. W. Parmele: "I would like 'satisfaction.'"

W. Stanley, Jr.: "More Chinese hair for lamp filaments."

John S. Huyler: "Here, Santa, just take this box of candy to the Electric Club for a New Year offering."

S. J. Fox: "A fog horn—to compete with Gilbert sleeping."

A. Graham Bell: "A favorable Supreme Court decision would just fill my left stocking."

Geo. W. Davenport: "Give me the Spanish-American provinces for electric lighting."

Col. Fred. Mason: "Having first introduced hard-drawn copper wire, my honors are complete."

T. L. Fowler: "Cure for a cold."

O. E. Madden: "The perfect environments."

J. M. Brown: "Electrical expressage between Washington and New York."

Harry Haskins: "Is it not my turn to visit the Old World?"

James English: "The treasurership of a half-dozen more electric lighting companies, just to keep my hand in."

[*From Electrical Review, January 7, 1888.*]

SWEAR OFFS ELECTRIQUE.—THE GOOD RESOLUTIONS OF A FEW OF THE ELECTRICAL WORKERS.

G. W. Stockly: "I'll never take Gilbert out hunting with me again. He not only shot all the game, but drank up all the ginger ale."

Gen. E. S. Greeley: "The next soldiers' day at New Haven will get along without me as Grand Marshal, or I'll have to get a new pair of lungs."

Chas. Selden: "If you ever catch me experimenting with a messenger call wire by touching it to my tongue to see if it carries any current, you may put me down for a mugwump. I can taste that messenger call yet."

Nat. W. Pratt: "You will never catch me bluffing a newspaper man again as long as I live."

W. D. Sargent: "I will never ask the telephone association to adopt another wire gauge."

Henry Metzger: "Patience has ceased to be a virtue, and the next writer who gets my name spelled wrong can expect the worst."

C. N. Fay: "No more statistics for me; my gas meters can beat the world."

C. F. Annet: "You can't expect a man to 'swear off' out here."

H. W. Pope: "I will never again attempt to run a square shooting match at a clam-bake against my meretricious brother."

S. B. Richards: "Enough of selling carbons. I'd rather be treasurer of an iron company at five thou."

C. R. Truex: "I will never, hardly ever—here! who threw that brick?—permit so much latitude in storage battery statements."

C. A. Benton: "I will never tell another ——. Thanks. A little lemon in mine."

R. W. Devonshire: "Don't have to swear off, you say? That is very kind. Speaking of advertising, I think we should increase the size of our card in your paper."

John Young: "If the W. E. don't fill those electric light orders, I'll be darned if I don't take a vacation."

Col. R. C. Clowry: "I'll promise not to knock out another opposition telegraph company—until it starts."

Geo. M. Meyers: "I'll promise not to start another telegraph company until the Pacific Mutual is 'knocked out.'"

Col. J. J. Dickey: "The next time I come to New York I will keep shy of that man Dutton."

Chas. Dustin: "I did say that Hartford would always be my home, but Middletown is a pretty good place after all."

T. S. King: "You will never catch me going in at the wrong hotel door again."

J. J. Fowler: "Down South we don't have so much temptation. Will save my resolves until the telephone men meet in New York."

James Kempster: "No more Long Branch cottages for me."

Carbon Combination Hawks: "I will never monkey with the carbon buzz-saw again."

Chas. Heisler: "I've swore off on 'Summer carbons.' There's nothing in it."

B. E. Sunny: "Electric light wires are not so bad for telephone wires after all, come to think of it."

Walter C. Kerr: "Swearing off don't count on Electric Light Association presidential nomination."

Dr. Leonard Waldo: "It will be a cold day when I undertake to explain to an English brother the difference between a self-given title of electrical engineer and that of an electrician."

D. L. Hungerford: "You will never catch me bluffing on what I'll do for the Electric Club again. No, siree."

A. J. De Camp: "Not another electric light bid from me. I have exhausted the supply."

L. M. Fishback: "I am never going to leave St. Louis again."

W. M. Habirshaw: "Experience is an excellent instructor, and I shall trust my own knowledge from now on."

Parker W. Page: "Never again will I resign—glad it wasn't accepted."

G. G. Ward: "Them's my sentiments."

A. L. Bogart: "This thing of working 14 hours at my office I have decided to stop."

H. P. Frost: "Those who faucy wild Texas lands can have them. I prefer pastures nearer New Haven."

Geo. H. Pride: "With the finest office building—the Equitable—in the country, guess I'll swear off on any other electrical work."

Judge W. H. Kelley: "Think I know when I have had enough underground conduit business."

Geo. L. Wiley: "Those who enjoy life among the Mexicans are differently constituted from your humble servant. No more for me."

M. E. Baird: "If you ever see me rub up against a dynamo again, you may put me down for an electrified imbecile."

A. W. McLaughlin. "Perfectly satisfied with my past electrical experience. Corner lots in Kansas City discount everything."

Geo. N. Stone: "1888 may come and go, but it will not see me show another telephone subscriber the 'kickers' board—unless I know his line doesn't end there."

Chas. A. Tucker: "I might swear off on taking electric light contracts, but that is what I am here for."

H. H. Eustis: "Will never wear my neat fitting hat on New York visits."

H. A. Cleverly: "I will not leave Philadelphia for one year."

T. Carpenter Smith: "Never again will I claim to compete in good looks and martial figure with Major Jim English. Yet many friends say I should win."

F. J. Boynton: "To have to celebrate my election as treasurer of the Boston Electric Club on New Year's, in addition to the usual festivities, has caused me to decide to swear off on everything."

P. H. Alexander: "Here, too, as president."

W. J. Jenks: "If I could only convince my good friends of the press that I had never been an editor I might be able to swear off on writing for the newspapers."

E. T. Lynch, Jr.: "No more proposals from me; this is leap year."

L. Stieringer: "I can't continue to invent lamp sockets if Carty and Beggs and Jenks keep me up talking to them every night until 2 A. M."

F. G. Stone: "I'll swear off kind of generally, except on learning French in Boston."

H. A. Reed: "When I'm caught on the Piano Committee again it will be a cold day."

A. G. Newton: "I will swear off on everything except Eddy's improvement in electric motor."

Hugh J. Toland: "On letting Gilbert put up any more electric lamps."

Captain E. L. Zalinski: "Now that I am a Captain, U. S. A., all my friends should swear off on calling me Lieutenant."

Felix Gottschalk: "The man that says the Electric Club's glass door is stuck together with red putty again, will swear off for the last time."

James Brown: "My firm resolve is not to test any more rheostats on the ocean cable."

Ed. J. Hall, Jr.: "I shall swear off on trying to keep secrets from newspaper men, particularly the REVIEW staff."

Chas. J. Kintner: "Never during this year will I refuse $15,000 cash for a half interest in a patent."

Views in the Works of the Berlin Iron Bridge Company.

In any department of structural iron work, from a lawn fence to a great iron bridge, the Berlin Iron Bridge Company, of East Berlin, Conn., stands at the head. One of their principal specialties, however, is the construction of modern electric railway power houses, central electric lighting stations and car barns. The Berlin Iron Bridge Company have done a great deal of this latter class of work, and the many examples of their skillful engineering to be seen in the principal cities of this country show the great popularity their work has attained in the electrical field. That their facilities for handling any iron contract, from the smallest to the largest, are amply sufficient will be observed from the following brief description of their immense works.

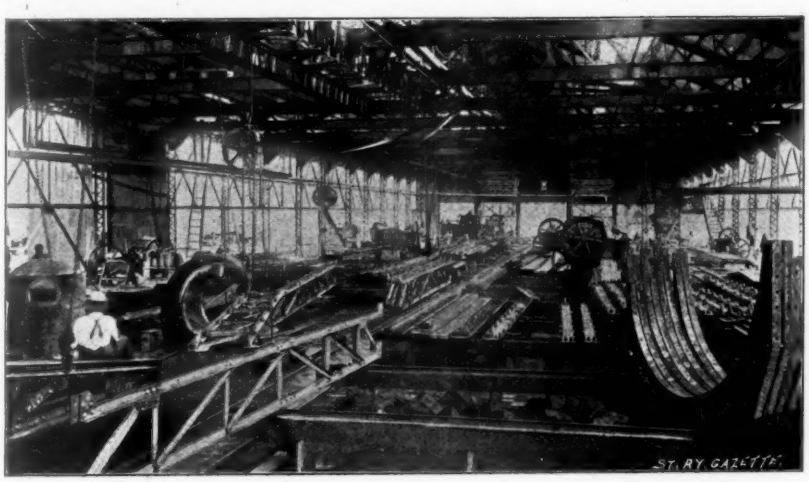
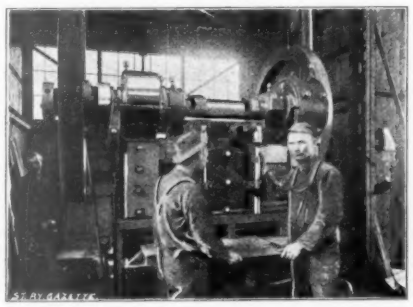


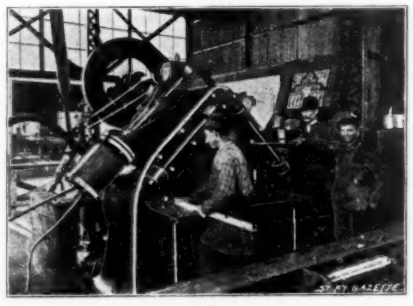
FIG. 1.—INTERIOR VIEW OF THE BERLIN IRON BRIDGE COMPANY'S TRUSS SHOP.

The railroad facilities for shipping are exceptionally good, and the means for quickly and safely handling large masses of iron are admirable.

The business offices, draughting rooms and engineers' offices are located in a two-story building which is constructed with a special view to an abundance of light. In a fireproof room adjoining the offices is filed the company's large collection of photographs, drawings and cuts illustrating the work it has done.

The manufacturing facilities are so arranged that the work travels steadily from north to south from the draughting room to the paint shops, where the iron is loaded on the cars. The accompanying illustrations show an interior view of the company's truss shop and two of the shearers in use.





FIGS. 2 AND 3.—PLATE SHEARER AND ANGLE SHEARER IN THE BERLIN IRON BRIDGE COMPANY'S SHOPS.

The Berlin Iron Bridge Company was organized in August, 1871, and its plant is located at East Berlin, Conn., on a branch of the New York, New Haven and Hartford Railroad. The works cover an area of 13 acres, and the company gives employment to 1,200 men.

A Victory for the American Bell.

The United States Circuit Court of Appeals on January 2, in the writ of error brought by the American Bell Telephone Company against the Western Union Telegraph Company and others, ordered the decree of the United States Circuit Court reversed and the case remanded to that court for further proceedings. The opinion of the Court of Appeals is to be filed later.

The decision probably settles for good alleged claims against the Bell company for a division of the stocks held by the latter company in consideration of franchises. The Bell company pays 20 per cent of its rental receipts to the Western Union Telegraph Company under the original telephone consolidation agreement. The Western Union claimed later 20 per cent of the stocks of local companies given to the Bell company for franchises. Judge Lowell as master decided in favor of the Bell company. The Western Union company asked to have the case discussed without prejudice. The lower court agreed and the Bell company appealed demanding a determination. The Circuit Court of Appeals has now decided in favor of the Bell company and a decision in the Bell company's favor must follow.

The contract between the American Bell Telephone Company and the Western Union company expires in November, 1896. What then?

PERSONAL.

Mr. J. W. Marsh, vice-president of the Standard Underground Cable Company, of Pittsburgh, was among the New York visitors last week.

Colonel B. W. Wren, a well-known railway man of the South, has accepted the position of passenger traffic manager of the entire Plant railway system, the Savannah, Florida and Western Railway Company. Colonel Wren is an experienced railroad man, and is to be congratulated upon this responsible position.

Mr. J. E. Talbot, formerly with the Fort Wayne Electric Company, has recently accepted a position with Linton & Southwick, manufacturers of station switches and apparatus. Mr. Talbot is a good man and will meet many old friends as he travels in the electrical field.

Mr. John B. O'Hara, managing editor of the *Western Electrician*, was married at Rochester, N. Y., to Miss Margaret Hickey on December 27. The ELECTRICAL REVIEW extends its sincere congratulations. Mr. O'Hara has many friends in the electrical industry, but none warmer than those in his own profession, who, perhaps, are in a better position to appreciate his many good qualities.

Mr. A. H. Reece, until recently with the General Electric Company and formerly that company's manager at Denver, has been appointed manager of the Fort Wayne Electric Corporation's St. Louis office, which has been established at 60 Turner building. Mr. Reece is one of the best informed and most experienced members of the electrical fraternity, and the Fort Wayne Electric Corporation is to be congratulated on securing his services.

The following gentlemen have connected themselves with the selling department of the New York Insulated Wire Company, 15 Cortlandt street, New York city, manufacturers of the well-known Grimshaw wires: James F. Kelley, recently manager of the General Electric Company's wire department; Howard C. Whitney, formerly connected with the sales department of the Crocker-Wheeler Electric Company and the Interior Conduit and Insulation Company; and Lewis O. Brewster, who has been manager of the New York office of Almon & Sargent, of Boston.

THE PROCEEDINGS OF THE
International Electrical Congress
HELD AT
CHICAGO, 1893.
This is a highly interesting and valuable Book. No Electrical Library complete without it.
PRICE, - - - $3.00
Send your orders for prompt filling to the
ELECTRICAL REVIEW,
13 Park Row, N. Y.

TELEPHONE RATES.
The improved New York City Exchange Telephone Service, metallic Circuit Lines, long distance equipment, is now offered by us at rates which bring it within reach of even the most moderate users. The prices per year are as follows:
Combination Line, $80.00
Direct Line, - $120.00
And Upwards, According to Use.
No Extra Installation Charge.
The Metropolitan Telephone and Telegraph Co.,
18 CORTLANDT STREET.

FACTS. Electrically-driven machinery is modern and proper.
Crocker-Wheeler apparatus is the best for this purpose, liberally proportioned, a generous factor of safety, and no trouble, if you allow us to advise you.
Crocker-Wheeler Electric Co.
Manufacturers and Electrical Engineers,
NEW YORK.
CHICAGO.
BOSTON.
PHILADELPHIA.

KINDRED INTERESTS

Removal.—Edward W. Patton and the Williamsport Wooden Pipe Company have removed their offices from the Builders' Exchange to very pleasant quarters in Rooms 403 and 404 Betz building, Philadelphia.

The Law Battery Company, of 85 John street, New York, is one of the pioneer battery houses that has an enviable reputation for excellence of product and reliability. Their open circuit batteries have a world-wide fame.

S. F. B. Morse & Company, 225 Dearborn street, Chicago, announce that they have succeeded to the business of the well-known firm of Cushing & Morse, which has been dissolved. The new firm will continue to fill promptly all orders for kerite wires and cables for all services. They will carry a large stock of these popular wires.

Baker & Company, of Newark, N. J., the platinum refiners, announce that they will purchase the platinum contained in the bases of burned out incandescent lamps. They invite correspondence from all companies and persons interested. Electric lighting people generally should write to this company. There is often quite a sum realized from the sale of this valuable metal.

The Associated Trade and Industrial Press, of Washington, D. C., has opened offices in London and Paris for the more convenient handling of the important industrial news of the entire European continent. This bureau has already established a flattering reputation in the United States, and its new foreign connections, which are of the very best quality, will doubtless add materially to the efficiency of its service.

The Berlin Iron Bridge Company, of East Berlin, Conn., are building a new power house for the Sing Sing Electric Light Company, at Sing Sing, N. Y. The building is 50 feet wide and 100 feet long, the roof being covered with the Bridge company's patent anti-condensation corrugated iron. The New England Pin Company, at Winsted, Conn., have placed a contract for the bridge connecting the two departments at their works with the Berlin Iron Bridge Company, of East Berlin, Conn.

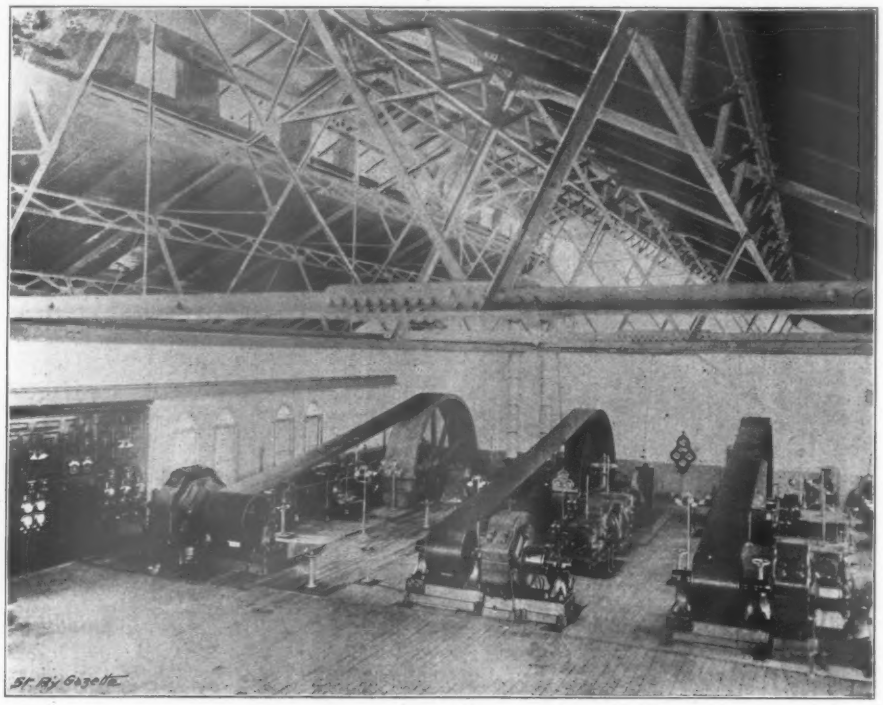
The Armington and Sims Engine Company, Providence, R. I., have recently completed a number of important orders for their well-known and popular engines. Governor Frank Brown, of Maryland, president of the Baltimore Traction Company, recently ordered two direct acting Armington & Sims engines of 400 horse-power each. These are now on their foundations and will soon be ready to run. The Baltimore and Ohio Railroad ordered four Armington & Sims cross compound condensing engines of 300 horse-power each for their new electric power plant which will furnish current for the electric locomotives hauling trains through the Baltimore tunnel. These engines are also completed.

The Power Station of the Steinway Railway Company.

Among the electric railway power stations which have recently been constructed in the vicinity of New York city is that of the Steinway Railway Company, located at Hell Gate on the Long Island shore. This company operates about 28 miles of road running through the business and residence sections of Long Island City, Ravenswood, Astoria and Steinway and extending to Bowery Bay Beach.

The power station is constructed of brick and is in the form of an L. The engine room is 70x128 feet and the boiler room is 68x87 feet. The roof is an example of the most modern construction, the trusses being of steel and the whole having been constructed by the Berlin Iron Bridge Company, of East Berlin, Conn. The accompanying illustration, reproduced through the courtesy of the *Street Railway Gazette*, gives a very good idea of the appearance of the engine and generator room and also of the construction of the roof.

The station is provided with a traveling crane of 12 tons capacity, furnished by the Berlin Iron Bridge Company. The plant is designed for about 3,500 horse-power engine capacity, 1,500 horse-power of which has already been installed. The electrical generators now in place consist of two 300-kilowatt and one 500-kilowatt machines made by the General Electric Company. The belting used was supplied by Chas. A. Schieren & Company, of New York.



INTERIOR VIEW OF ENGINE AND GENERATOR ROOM, STEINWAY RAILWAY COMPANY.

WOVEN WIRE BRUSHES.

The Belknap Motor Co., of Portland, Maine, are the patentees and manufacturers of the best woven wire commutator brush on the market.

"Candee will sustain you in the most trying situations" is the graphic way in which the Central Electric Company, of Chicago, announces the virtues—not of Candee, the individual—but of the popular Candee weatherproof wire. This statement is evidence of faith and experience.

ROYCE & MAREAN,
DEALERS IN
Electrical Supplies,
WASHINGTON, D. C.

MAGNETO AND BATTERY
TELEPHONES AND SWITCHBOARDS.
C. F. DUNDERDALE,
42 West Quincy St., Chicago, Ill.

PLACE YOUR **LIGHT RIGHT** WHERE YOU WANT IT.

Catalogue FREE.
FARIES' PATENT UNIVERSAL LAMP HOLDER,
Several Styles and Sizes.
Ask your dealer for them or write direct to
FARIES M'F'G CO., Decatur, ILL.

ELECTRO-MAGNETS
FOR ALL
ELECTRICAL PURPOSES.
The Varley Duplex Magnet Co.,
64 CORTLANDT ST., N. Y.

ELECTRICITY
Free

Apparatus.
DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to The Correspondence School of Industrial Sciences, Scranton, Pa.

Sight Feed Oil Cups.
AUTOMATIC "WIPING DEVICE"
For oiling Crank and Cross-head Pins.
WM. H. WILKINSON,
352 Atlantic Ave., Boston, Mass.

A Suggestion That Everyone Should Heed.

Put your savings in an investment exempt from fluctuation in value and beyond the reach of commercial disaster.

There are no receiverships, reorganizations or repudiations possible in the promise to pay of the *Mutual Life Insurance Company.*

The income of the Mutual last year was $41,953,145.68; its outstanding insurance $708,692,552.40, and its assets $186,707,680.14.

Every desirable form of policy is issued by the Mutual Life Insurance Company.

For particulars, address
WALTER H. COOKE,
32 Liberty Street,
NEW YORK CITY.